

VOLUME
VII
OCT.
1898
No. 10

THE BRICKBUILDER

OFFICE
85
WATER
STREET
BOSTON

THE BRICKBUILDER.

AN ILLUSTRATED MONTHLY DEVOTED TO THE ADVANCE-
MENT OF ARCHITECTURE IN MATERIALS OF CLAY.

PUBLISHED BY

ROGERS & MANSON,

CUSHING BUILDING, 85 WATER STREET, BOSTON.

P. O. BOX 3282.

Subscription price, mailed flat to subscribers in the United	
States and Canada	\$2.50 per year
Single numbers	25 cents
To countries in the Postal Union	\$3.50 per year

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Entered at the Boston, Mass., Post Office as Second Class Mail Matter,
March 12, 1892.

THE BRICKBUILDER is for sale by all Newsdealers in the United States
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THE BRICKBUILDER is published the 20th of each month.

HARD TIMES AND HIGH IDEALS.

WE remember a very interesting friend of an extremely religious turn of mind who used to assert that one could not be in a truly pious frame of mind unless he was a little bit hungry. Applying the same reasoning to hard times and art, architecture and building ought to show some pretty high ideals just at present, for, notwithstanding the repeated asseverations of the daily press that good times are upon us, we know by sad experience to the contrary. The volume of business may be large, but the margin is extremely small. The hope that springs perennially leads us to anticipate all sorts of delightful possibilities for 1899; but while we are passing through the hard times, it is, perhaps, not amiss for us to prepare for the fat years by brushing up our morals and adjusting our ideals. In the scramble for work, the keen, relentless competition which always accompanies the dull season, it is very easy to drop some of our restraints and to feel that we must get work, honestly and fairly if we can, but we must get it, and the temptation to ignore ethical ideas is one which assails the mechanic and tradesman no less than the architect and constructor. The lean years which are upon us are surely not warmly desired, and yet, like many of our earthly discomforts, they may be turned to a good purpose. We know of one large manufacturer whose output has been largely reduced, profits cut almost to nothing, and expenses increased beyond expectation, who deliberately sets himself to take advantage of the dull season by improving the quality of his product, experimenting with new

methods, and, by developing his present methods, striving to be ready for the boom when it shall come. We have in mind a prominent dealer in building material who takes advantage of the slack times to cultivate the acquaintance of his business friends, making new connections and incidentally gathering many ideas which in the rush of business would be beyond his reach. We hear of several architects who are now able, for the first time in several years, to have long, serious talks with some of their contractors, with mutual benefit, and who are utilizing the enforced period of leisure by kinds of study which have been denied them when their offices were more crowded. We regret the hard times, we all want the income; but if we can build up our ideals, thereby making our occupation a part of ourselves, making it less a drudgery, the experience may not lack in positive value for the future. At any rate, because we are not building palaces we need be no less conscientious in our henhouses, and if we are not all of us occupied with State capitols, we can at least get some pretty good results out of the spare tables and chairs which our kind friends allow us to design.

THE time may have been once when success in architectural design was a matter of accident, or when those to whom the creation of great buildings was entrusted could depend upon their instincts and the inspiration of the Muses; but we have changed all that with our modern civilization, and if there is any one profession of to-day that requires long and arduous preparation, it is that of the architect. Constant, unremitting study is the only safe program for the man who would take rank. It has been our editorial privilege to be called upon repeatedly for advice to those who contemplate becoming architects. The usual rule is to find the young man eager to enter an office, anxious to begin actual work, looking forward to immediate worlds of conquest. Even when a kindly restraining influence has harnessed him into the routine of one of our best technical schools, his impulse after graduation is still to build, to hang out his shingle, to get to work, and the idea seems to be that if by some mental *tour de force* he can compress into three years the amount of study that is laid out for five or six, it is well worth the effort. The difference between this point of view and the principle which seems to actuate the French students of architecture goes, perhaps, a considerable way towards explaining the manifest superiority of the French school in its methods. With us the aim is to complete the studies as speedily as possible and start to work. With them it is not in how little time can education be acquired, but rather how many years can the student devote to preliminary training. It is often discouraging to the aspirant, who has, perhaps, come from the Institute flushed with his diplomatic honors, to be told to take a humble seat and keep on studying for five or six years more before he allows his kind friends to give him a job, but all experience shows that our young men are apt to start too soon rather than to delay too long, and that, other things being equal, the man who hangs out his sign and begins his professional career with the greatest amount of experience behind him will have the richest measure of true success. The secret of success in any profession, in these days, is not inspiration, not native talent, nor even that *sine qua non* of the architect, good and complacent friends, but thorough preparation and unlimited, hard dig.

PERSONAL AND CLUB NEWS.

JAMES L. CHESEBRO, architect, Hartford, Conn., has moved his office to 50 State Street.

B. HAMMETT SEABURY, architect, has moved his offices to the Besse Building, 368 Main Street, Springfield, Mass.

ALONZO T. HARMER, architect, has opened an office at 114 Liberty Avenue, Jamaica, N. Y. Catalogues and samples desired.

H. E. BONITZ, architect, Wilmington, N. C., will be glad to receive manufacturers' catalogues and samples.

WALTER H. KILHAM, architect, has opened an office in the Phillips Building, 120 Tremont Street, Boston. Catalogues and samples desired.

WALTER I. GIDEON, architect, formerly of Washington, D. C., has opened an office in the Sheppard Building, Springfield, Mo. Catalogues and samples desired.

THE firm of Brainerd & Holsman, architects, Chicago, has been dissolved by mutual consent. Mr. Holsman will continue the business with offices in the Young Men's Christian Association Building, Chicago.

ON the evening of September 28, the Builders' Club, of Chicago, tendered a "smoker" to the members of the Chicago Architectural Club.

BOHEMIAN Night was observed at the Chicago Architectural Club on the evening of September 19. Messrs. Frank W. Kirkpatrick, Wm. H. Eggebrecht, August C. Wilmanns, J. C. Llewellyn, N. Max Dunning, A. G. Zimmerman, and Clarence Hatzfeld were hosts.

MR. FRITZ WAGNER, of the Northwestern Terra-Cotta Company, has offered three prizes: first, of \$50; second, of \$30; third, of \$20, for the three best designs for a terra-cotta column and lintel with wall surface above, to be competed for by members of the Chicago Architectural Club.

THE T Square Club, of Philadelphia, with its usual and commendable spirit, appointed a special committee to consult with the municipal authorities in regard to the decorations and architectural accessories which were to be erected and displayed along the line of march for the Peace Jubilee. Although their services were not accepted on this occasion, arrangements having progressed too far to permit of alterations, as a result of their overtures they have been promised the supervision of the work on the occasion of the next national reunion of the G. A. R., which will be held at Philadelphia next year.

THE St. Louis Architectural Club met on Saturday evening, October 1. Reports of the different committees were received; \$40 was appropriated for the use of the Lantern and Lecture Committee, and \$100 for the Library Committee. Mr. B. H. Brown gave the club Owen Jones's "Grammar of Ornament," and Kidder's two volumes on "Building Superintendence"; Mr. Neimann, the first volume on "Architecture," by T. Roger Smith, and Mr. Enders gave the four volumes of the "Kensington Schools on Construction." The committee reported that the controversy between the club and the local chapter A. I. A. had been amicably settled, and Mr. C. K. Ramsey, of the chapter, was present and gave a little talk.

THE T Square Club held its first regular meeting of the present season on Wednesday evening, October 5, at which a large number of members were present. The subject for competition at the meeting was "Sketches Made by Club Members During the

Past Year," and mentions were awarded as follows: First mention, John J. Dull; second mention, Oscar M. Hokanson; third mention, James P. Jamieson. The third annual exhibition of the club, in conjunction with the exhibition of paintings and sculpture, is to be held at the Academy of the Fine Arts, Jan. 14, 1899, to Feb. 2, 1899. The Jury of Selection and Hanging Committee for the Architectural Exhibit will be composed of Mr. John Galen Howard, of New York, Mr. C. Howard Walker, of Boston, and Messrs. Edgar V. Seeler, Adin B. Lacey, Herbert C. Wise, Horace H. Burrell, David K. Boyd, James P. Jamieson, and William L. Bailey, of Philadelphia. All correspondence regarding the exhibition should be addressed to Albert Kelsey, Corresponding Secretary, 931 Chestnut Street, Philadelphia.

THE Chicago Architects' Business Association has passed a resolution declaring that it is the duty of the Illinois State Board of Examiners to prevent the practise of the profession of architecture by all unlicensed persons, and to cause actions to be brought against offending parties. The association, at its annual meeting, decided that it would instruct its attorney to institute proceedings to compel the examining board to enter these actions, and to prevent the board from paying the funds it collected into the State treasury until the expense of such prosecutions had been paid. The Architects' Association also passed a resolution sustaining the professional character of the work of Normand S. Patton as school architect.—*Const. News.*

HARWOOD HOUSE, ANNAPOLIS.

PLATES 73 and 74. This house was designed by Buckland, and built between 1770 and 1780. It was made low in order not to intercept the harbor view of the Chase House, which stands directly opposite. The brick is laid in Flemish bond, with quarter-inch mortar joints, and is of the rich color peculiar to Southern colonial work. The exterior detail is finely carved wood, and the interior is handsomely decorated throughout in a similar manner. The parlor in the rear of the first story leads directly out on the garden and is handsomely decorated in arabesque.

The house was built for William Hammond, an Annapolis lawyer. It was sold to Chief Justice Chase, and has remained in the family of his granddaughter, wife of William Harwood.

ILLUSTRATED ADVERTISEMENTS.

THE Bank of McKeesport, McKeesport, Pa., Longfellow, Alden & Harlow, architects, is illustrated in the advertisement of the Harbison & Walker Co., page xv.

Townsend Memorial Hall, Ohio State University, Peters, Burns & Pretzinger, architects, is illustrated in the advertisement of the Celadon Terra-Cotta Co., Ltd., page xxvii.



TERRA-COTTA WINDOW MULLION.
Executed by the New York Architectural Terra-Cotta Company.

The American Schoolhouse. XII.

BY EDMUND M. WHEELWRIGHT.

(As the writer has been unable to collect all the material requisite for the completion of these papers following the order first intended, it has been found necessary, in order not to break the issue, to give now the specifications for a school building which was promised in the announcement of the editors. The other subjects will be treated in later issues.)

SPECIFICATIONS FOR A SCHOOL BUILDING.

SECTION I. THE WORK TO BE DONE IS TO — (a) Erect and complete with materials and workmanship of the best quality and character, unless definitely specified to be otherwise constructed, the [Blank] School Building upon a site, at the corner of [Blank] and [Blank] streets, [city,] [State,] the building is to be of brick with stone trimmings, and the contractor is to furnish and do to the satisfaction of the architect everything required therefor, except that the contractor, unless otherwise specifically provided in these specifications, is not to furnish or install the plumbing, or the heating, or ventilating apparatus, including all metal ducts, registers, screens, netting, etc., required for any of said apparatus, or the movable furniture, or the wiring for the electric lighting, electric clocks, bells, or telephones; but the contractor is to do all jobbing required in connection with the work of installing the plumbing, heating, and ventilating apparatus, and the placing of said electric wiring, tubing, and fixtures, including the furnishing and putting up of boards for the support and covering of pipes, and the doing of all cutting, fitting, and filling necessary for the completion of the building in connection with said plumbing, heating, and ventilating apparatus, wiring, tubing, and fixtures, or any of them. No cutting shall be done without permission of the architect.

(b) The contractor shall carefully protect the work from injury from the weather and from water, frost, accident, or other cause, and repair any such injury; shall make good any defect, omission, or mistake in the work within such time as shall be required in any notice so to do, signed by the architect and given to the contractor or mailed to him at the business address stated by him in his proposal, whether so given or mailed during the progress of the work or after its completion, and whether any inspection or approval of, or payment for, the work or any part thereof may have been made or certificate for such payment given.

(c) The contractor shall furnish and maintain temporary doors and screens for all openings in the building, and protect the work from the weather whenever the architect shall so direct. The contractor shall supply heat and attendance for drying out and protecting the building during construction.

(d) The owner will permit the use of the boilers by the contractor when the mains and returns for addition have been installed and when the contractor has installed the temporary radiators as hereinafter provided. Before such possible use of the boilers, etc., for heating the building the contractor shall, when required by the architect, furnish temporary heaters, stoves, fuel, and competent attendance for the same, and shall maintain the heating as required until otherwise directed in writing by the architect. The contractor shall leave the boilers in perfect condition at the termination of his use thereof and he shall then supply and set new grates for same.

When mains and returns are installed the contractor shall furnish and connect temporary radiators, and is not to remove the same until so ordered in writing by the architect. Heating will be required for the protection of the work, for the drying of plaster, and continuously while interior finish is being set and painted, and for thirty-one days after the acceptance of the building by the architect.

(e) The contractor shall furnish and lay all water-pipes, gas-pipes, and drains from inside the walls of the building to, and connect the same with, the street mains, as shown on plans or as directed by the architect.

(f) The contractor shall furnish and maintain a temporary water-closet approved by the architect, in the place shown on the plan or as directed by the architect, and allow the same to be used by every person doing anything relating to the erection and completion of the building, whether under this contract or others, and carry out all directions relating to such water-closet and its placing and removal given by the architect.

(g) The contractor shall take charge of and be liable for any loss of or injury to any materials delivered on, or in the vicinity of, the work to be used thereon, whether furnished by the owner or otherwise; notify the architect as soon as any such materials are so delivered, and furnish men to handle them for examination by the architect or his assistants; and keep trimmed up in piles so placed as not to endanger the work all such materials, and all refuse, rubbish, and other materials not removed.

(h) The contractor shall pay all water rates for water required for anything in connection with any work on the building until its completion, and pay all other charges and fees incident to the doing of the work.

(i) The contractor shall leave an unobstructed way along public and private ways for travelers, street cars, and teams, and for access to hydrants; from the beginning of twilight through the whole of every night maintain near all places in the public ways obstructed or made unsafe by him sufficient lights to protect travelers in such ways from injury; provide proper walks for travelers over and around such places; provide and use all other lights, fences, guards, and watchmen on and about the work as directed by the architect; provide all necessary bridges and ways for access to



THE DE LANCEY SCHOOL, PHILADELPHIA, PA.

George C. Mason, Architect.

This school has a twofold purpose — first, to prepare boys for college, or a school of science, and secondly, to give a satisfactory English education to such boys as do not expect to take a collegiate course.

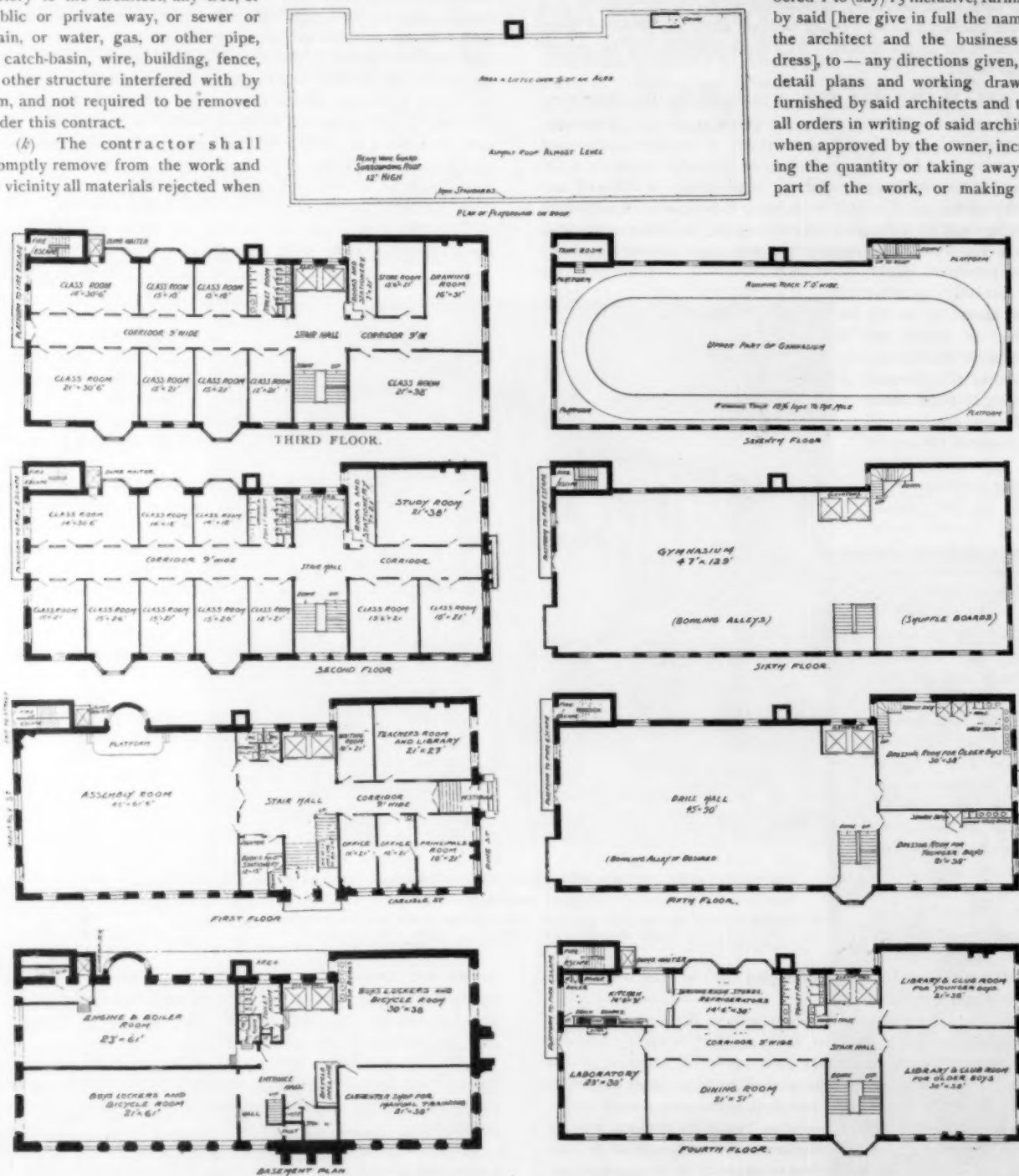
property where the existing access is cut off by him, and see that the neighboring residents are not unnecessarily inconvenienced; take all proper precautions to protect persons and property from injury by the carrying on of the work.

(j) The contractor shall replace or put in good condition, satisfactory to the architect, any tree, or public or private way, or sewer or drain, or water, gas, or other pipe, or catch-basin, wire, building, fence, or other structure interfered with by him, and not required to be removed under this contract.

(k) The contractor shall promptly remove from the work and its vicinity all materials rejected when

manner as not to flow upon or hinder the other work or cause any nuisance.

(N) The contractor in doing the above shall, so far as they go, conform to—these specifications, to—the plans and drawings marked [here quote in full the title given to the drawings] and numbered 1 to (say) 15 inclusive, furnished by said [here give in full the name of the architect and the business address], to—any directions given, and detail plans and working drawings furnished by said architects and to—all orders in writing of said architects when approved by the owner, increasing the quantity or taking away any part of the work, or making any



THE DE LANCEY SCHOOL, PHILADELPHIA, PA.

so directed by the architect and he shall remove promptly all rubbish when so ordered by the architect.

(1) The contractor shall maintain the flow in all water-courses, sewers, drains, and pipes interfered with by him, or convey the flow in covered channels to a suitable point of discharge, in such a

change in the form, materials, plans, or specifications of the work, or requiring the contractor to furnish any extra work or materials relating to the above; and shall cause all directions, relating to the work, given by the architect, to be promptly carried out, and everything to be completed on or before [Blank]. Said architects

are meant wherever the word architect is used in these specifications.

SECT. 2. GENERAL DIRECTIONS.—(a) The contractor shall not assign or sublet the work unless with the consent of the architect in writing; he shall keep the control and charge of the work and of every part thereof, and give his personal supervision thereto; he shall keep a competent foreman always present when anything is being done on the work; and he shall allow all other persons doing work for the owner free access to, and not interfere with them in their work.

(b) The building laws relating to buildings in said city, and all other regulations of law or public authorities, controlling or limiting the method or materials to be used, or the actions of those employed in doing the work, are to be carefully observed by the contractor, and all necessary permits are to be taken out, and all notices required are to be given by him. The contractor shall begin the work promptly and shall do the several portions thereof in the order designated in writing by the architect, but he is not to proceed with any portions of said work until so authorized in writing by the architect.

(c) The contractor shall follow figure dimensions in preference to scale dimensions in all plans and drawings, and in case of any discrepancy between the figures, or the figures and scale, or the drawings and specifications, the matter is to be submitted to the architect for adjustment, and any work done by the contractor before such adjustment is made shall, if the architect so requires, be replaced by work satisfactory to him.

(d) The contractor shall employ an engineer, competent and satisfactory to the architect, who shall lay out the work and shall establish all lines upon batter boards, and shall indicate grades; the contractor shall furnish substantial and convenient batter boards, shall maintain the same, shall have the lay-out tested from time to time by said engineer, and shall be responsible for all damage arising from any disturbance of the same.

(e) Full-sized detail drawings are to be furnished by the architect for such parts of the work as he shall desire; the contractor shall call for such drawings, and anything done relating to such parts, after such detail drawings are furnished, and not done in accordance with such drawings, is, if the architect so requires, to be replaced by work satisfactory to him.

(f) When for any reason the work is suspended, the contractor shall protect all the work, and the roadways and sidewalks shall be left by him unobstructed, and in a safe and satisfactory condition.

(g) The contractor shall keep himself fully informed as to the size, shape, and position of all openings and special accommodations required for heating and ventilating apparatus, plumbing, steam-pipes, tubing, wiring, boxing, and other things; and, in the absence of special drawings and information upon these several points, shall require and obtain such drawings or instructions before proceeding with any work which is affected by such requirements.

(h) The contractor will allow free use of his staging by other persons working upon the building.

SECT. 3. EXCAVATION.—Do all excavating required for the

work covered by these specifications. Such excavated material as is suitable for refilling shall be used for this purpose; the contractor shall supply all additional material for same which may be required, as directed by the architect, and he shall remove from the site all unsuitable or unneeded material.

SECT. 4. PILE-DRIVING.—(a) Do all necessary boring and sounding, and keep a record of the movement of piles at each blow of the hammer for the inspection of the architect.

(b) Furnish and drive the piles as shown by plan; all to be driven to hard pan, to be good, sound, straight, spruce piles, not less than 10 ins. diameter where cut off for capping-stone, or 6 ins. at the bottom.

(c) If any pile is split or driven out of position, the contractor is to drive a new one to take its place.

(d) Cut the piles off at grade 5.

SECT. 5. FOUNDATIONS.—(a) Build the foundations of the height and thickness shown on drawings, starting same on granite levelers, of the dimensions shown by drawings, and 18 ins. in thickness; the whole foundation to be of even-split block granite the full thickness of the walls, the length of the blocks to be about one third more than the width, to give a good lap to the bond, laid in pure, fresh hydraulic cement, having good beds, builds, and faces, and laid solid, a true and even face showing on the inside, and also on the outside where exposed, all thoroughly pointed.

(b) Plaster wall below grade and above cellar bottom in Portland cement on outside of wall and give one thick coat of hot asphalt. (See Asphalt, section 12.)

(c) Bond all walls and angles thoroughly.

(d) Finish level and true on top, ready to receive the superstructure.

(e) Leave holes in walls for drain, gas, and water pipes, and for ducts where shown and directed.

SECT. 6. CUT GRANITE.—Furnish and set the granite work; to be of best quality

[Blank] granite six-cut work; and to be as shown on general and detail drawings.

SECT. 7. BRICKWORK.—(a) No mason work is to be laid in freezing weather, except by written permission of the architect, and then only in accordance with such precautions as he may require.

(b) Construct all the brickwork indicated by the drawings, except where otherwise specified, of best quality hard-burned bricks, uniform in shape and size, and well wet, when necessary, before laying.

(c) Lay all door and window heads, jambs, arches, and stools in basement with round-cornered brick.

(d) Neatly rule all joints of exposed brickwork in basement.

(e) Bed each and every brick in mortar, under its bottom, sides, and ends, and bond the walls, unless otherwise specified, with course of full headers every eighth course, and lay in mortar as specified above.

(f) Set all the ironwork as called for by the plans and specifications; all plates to be set in cement mortar. Firmly bed and fill in around all beams, girders, etc.

(g) Point around all window and door frames with cotton and elastic cement; staff beads to be removed to do this work.



NEW BROWN SCHOOL, HARTFORD, CONN.

Wm. C. Brocklesby, Architect.

(h) All gas and electric pipes on plastered walls must be cut in to be flush.

(i) Fill up neatly all putlog holes, and clean down and point the entire work at completion, inside and out, where brickwork is exposed, using no acid stronger than vinegar, and oil with linseed oil, one coat, the exterior after the bricks have thoroughly dried from cleaning down.

(j) Carefully protect all work and leave the whole in a thoroughly clean and perfect condition at completion. Turn arches of required number of rings where iron beams or lintels are not called for.

(k) Furnish all wall ties and clamps not especially mentioned, but required by the building laws, of sizes and dimensions as directed by the architect, and build in all ironwork.

(l) Bed all wall plates in cement mortar on the walls.

(m) Furnish and set molded brick where shown in accordance with detail drawings.]

(n) Except where otherwise shown, the exterior brickwork is to be of selected Eastern water-struck brick, laid "Flemish" bond or as shown on general and detail contract drawings.

(o) Line the exterior walls, where plastered on inside, with hard-burned, hollow-clay brick 4 ins. thick, but all bonding brick and brick about door and window openings are to be solid hard-burned bricks as above (b).

(p) Lay the whole with perfectly level, plumb, and true bond, rule neatly the joints of all exposed work, and give the rough brickwork of all exterior door and window jambs one thick coat of hot asphalt. (See Asphalt, section 12.)

(q) Line the walls in basement with selected Eastern face brick, joints ruled for painting.

(r) Pave bottom of trenches and conduits in basement with best quality hard paving brick laid in Portland cement mortar.

(s) Build trenches and conduits of 8 in. brick walls, laid in cement, for all pipes inside building and as shown on drawings; the outside of walls of these trenches to be plastered with Portland cement and then given two thick coats of hot asphalt. (See Asphalt, section 12.)

(t) Line with hard brick the sides of trenches and conduits for pipes.

SECT. 8. CONCRETING. — (a) Level off the basement bottom and fill in with clean gravel 12 ins. thick to the grade required, and settle and ram the same solidly for concrete.

Concrete 6 ins. thick throughout basement, with concrete composed of three parts of clean, coarse, washed gravel, and one part of cement, truly leveled, well smoothed off and left perfect at completion. [N. B.: This thickness of concrete is advised only for buildings built on "made ground"; elsewhere 3 in. concrete is sufficient and Rosendale cement is sufficiently strong.]

(b) Furnish and lay concrete foundations as shown on drawing in proportions of one, two, and four.

(c) Imbed all iron or steel work below grade in concrete as in (b).

(d) For concrete work required for fire-proofing, see section 16.

SECT. 9. CEMENT.

— (a) Portland cement

shall be used for the concrete floor of basement,

for concrete foundations,

for pointing joints and

plastering of face masonry,

and for all brickwork below top of

ground. American natural

hydraulic cement shall be

used in other parts of the work.

The American cement shall

be equal in quality to the best

Rosendale cement, and the Portland

cement equal in quality to the best imported

Portland cement; both kinds shall be made by

manufacturers of established reputation, and

shall be fresh and very fine ground and put up

in well-made casks.

(b) All the cement

will be subject to inspection and rigorous test by

the architect, and if found of improper quality

will be branded, and must be immediately removed

from the works; the character of the tests to be determined by the

architect.

(c) The contractor

shall at all times keep in

store, at the site of the work, a sufficient quantity of the cements to

allow ample time for the tests to be made without delay to the work of

construction. The architect shall be notified at once of each delivery

of cement. All cement shall be stored in a tight building, and

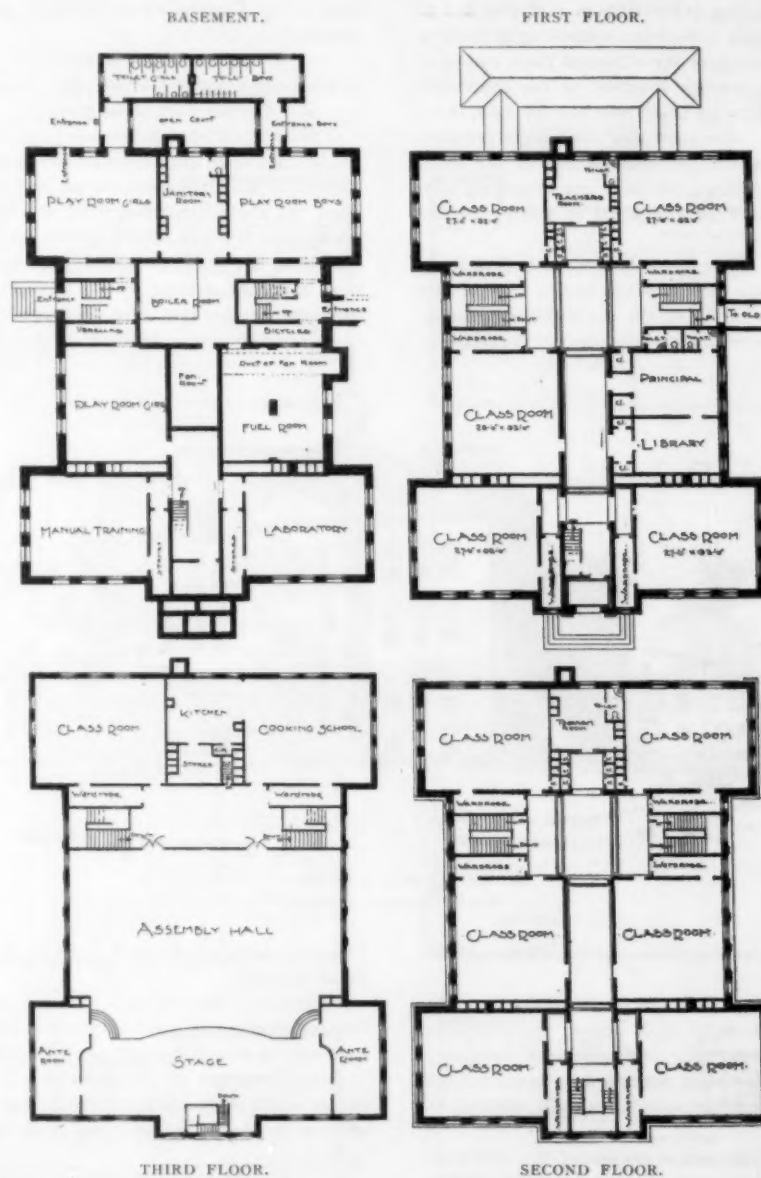
each cask must be raised above the ground by blocking or otherwise.

SECT. 10. SAND. — The sand used to make mortar shall be

clean and sharp, sufficiently coarse, free from loam and pebbles, and

equal to the best Plum Island sand.

(Continued.)



NEW BROWN SCHOOL, HARTFORD, CONN.

Suburban Residence Built of Brick.

COST, TEN THOUSAND DOLLARS.

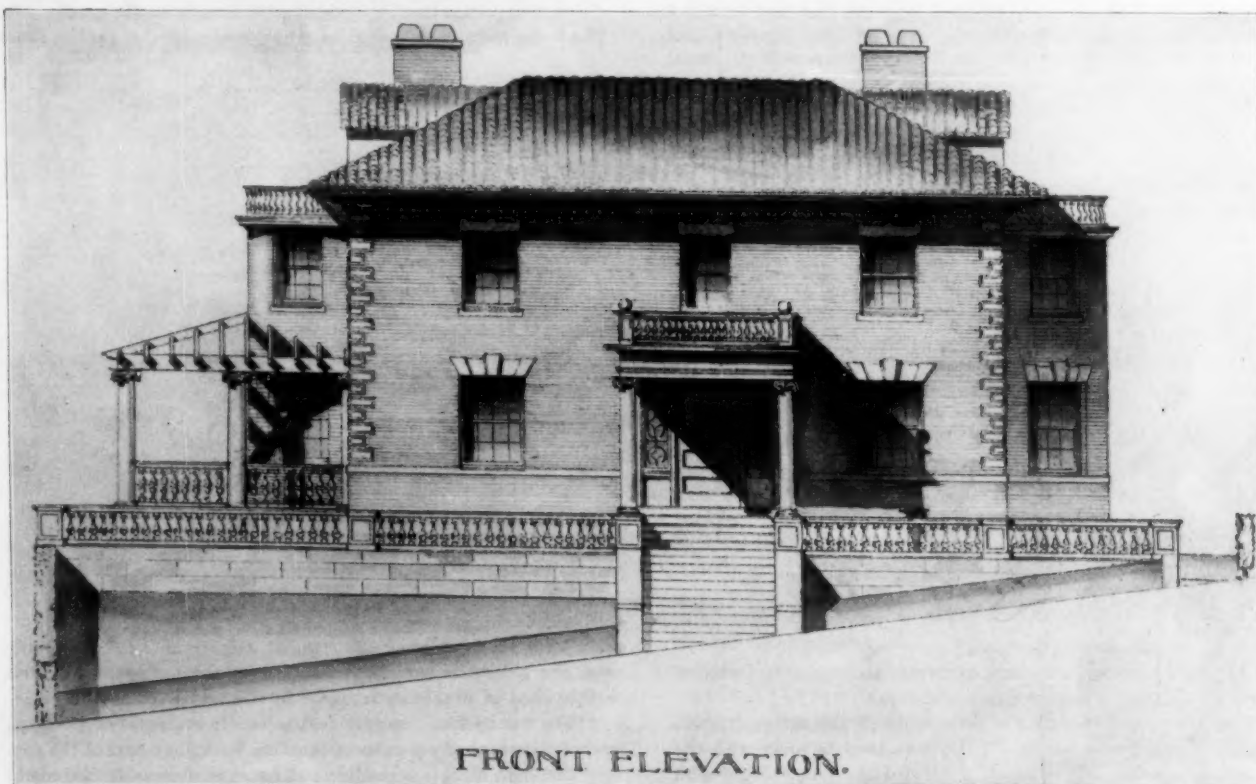
BY ALFRED B. HARLOW.

THE requirements for a suburban dwelling of moderate cost and extent, ever new and varied for each individual case and governed by varying conditions of exposure and contour of surface, present an every-day problem always of interest to the practising architect, but particularly engaging when he may from the beginning consider the house and its surroundings together, not merely as to the location of the cellar wall and its height above grade, but giving place to gardens, hedges, and walks as essential and important factors of an harmonious whole.

It seems as easy and quite more satisfactory to consider the walks and gardens along with house walls and rooms, and so study the whole plan rather than the house plan only; the walks expressive of entrances and halls, and beds and sodded areas standing for

spots,—so essential an adjunct to a suburban place,—I have adopted the wall and terrace treatment which could be economically carried out by bringing the earth to the front from the rear, and building necessary retaining walls of any local stone that would present an approximately even and formal surface. The house thus rests on a level plateau of which it becomes a part by the continuation of its lines in the architectural treatment of balustrade, steps, and walks, and its severity is relieved and interest added by dropping again to the natural grade on the front, the slope contrasting pleasantly with the level line of the balustrade capping the wall at the terrace.

The easy approach to the floor level of the house over the several groups of steps and level spaces, worked out with and required by natural conditions, would possess a charm and interest not to be acquired by straight and level approaches or forced and irregular pathways. The level of the terrace reached, the grass plots and walks behind the balusters suggest a desirable privacy, and the garden or porch is at hand on the left or the main entrance for the formal caller directly in front. A side path at the right leads



room space plotted out within. True, in execution they may not be seen together, but the influence of relationship will be felt and unconsciously recognized.

In the plan presented such a study has been made and a scheme indicated for an arrangement of plan and grounds in a simple and unpretentious way, well within the lines for a place of moderate cost and extent, and suggestive of a method of study that would result in harmony and individuality in the arrangement and composition of house and grounds, in place of ill-considered planting and approaches, arranged as best may be after the structure is completed, and so much in evidence in all suburban districts.

In the problem presented the conditions of grade are such as to involve a system of terracing, or a frank acceptance of the natural lay of the land with a more or less picturesque treatment of the architectural part of the problem.

As the latter method would give no level lawn spaces or garden

from the natural street grade directly back to the kitchen, basement and kitchen gardens, and a gradually rising retaining wall following the lot line on this side gives a practically level walk to the rear.

On the left of the house the porch and sunken garden with its arbor shelter along the line of a high dividing wall afford seclusion and a restful spot not disturbed by adjacent property or the domestic machinery of the house, which goes on on the opposite side of the place.

At the rear of the house a series of terraces on the rising land may be arranged, occupied by kitchen gardens, tennis courts, etc., a small gateway through the hedge opening to a walk on the left, and the service walk continuing along the right side.

The walks may be a red brick for the approaches, or perhaps the very practical though less artistic artificial stone may be used for both steps and walks, with the garden walks of fine gravel.

Coming now to the material for such a house, and leaving out of account any question of a frame building, we naturally turn to brick

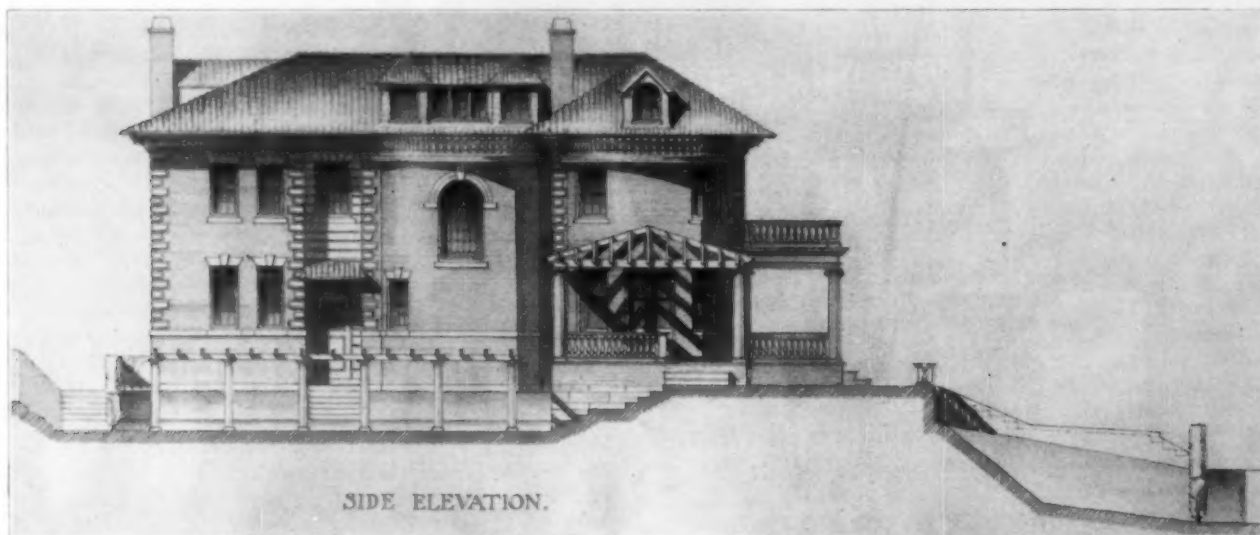
as the most satisfactory material within our means; and combining, as it does, an air of domesticity with good color and scale, it is on the whole the most satisfactory substance we could choose.

It is proposed that this house shall be built of brick of the simplest character, the plain gray-red stock brick laid with wide lime-mortar joints, making an unpretentious wall, but, with its varied and sparkling surface, a wall that is always good, that belongs to the vines that cover it, and the grass and shrubbery that grow up against it and make it a part of themselves.

The pressed brick in its varied shapes and colors finds a wide field in the requirements of formal town architecture, but in the country or for such a suburban dwelling as this article considers, its surface lacks the desired texture and touch of time that is found in the more modest but picturesque article proposed, and with the Flemish bond, which, of course, is used in laying our brick, we have already a smack of quaintness to our wall before the roof is on.

For the masonry details of the exterior terra-cotta is adopted as a mobile material of enduring qualities and slight expense. By its use we are enabled to adopt the decorative line of cornice topping out the wall, with its richly modeled egg and dart and modillion courses carrying the wide-spreading eave of light wooden beams,

toward the north, the dining room properly accessible from the china closet and kitchen, and catching the morning sunlight, as it always should; the reception room having the morning as well as afternoon sun, and the living room receiving the whole afternoon and the sunset light. The most wholesome and desirable house is that receiving all the sunlight possible, and to so locate the rooms that they may receive the sun as nearly as possible in the order of their use from morning on through the day seems most desirable. The English fashion of a separate or detached staircase hall has many advantages, and the idea has been adopted here. The entrance hall of moderate size can be handsomely treated in wood, and it gives a long vista from end to end of the house and forms an attractive focal point, from which the rooms radiate, and which they directly adjoin as they cannot do in a small hall blocked with a staircase; neither is the attractive feature of a staircase lost, as it is seen from the main hall, out of which it directly opens. In itself, too, the staircase hall is an attractive feature opening on the axis of the dining room with its windows overlooking the garden, and its side entrance giving from the dining room directly to a raised terrace somewhat above the garden level, and on a path directly in the garden axis. The living room, which, with its porch, overlooks the garden, forms



and to give a touch of refinement to corners and angles and window lintels by the introduction of ornamental detail.

For the proper rendering of delicate detail the terra-cotta will be white, finished with a combed surface to keep in touch with the texture of the brick wall, to which it will also be related by the echo of its color in the woven lines of white joints. The gain in quiet and repose in a red and white combination of materials by the use of white mortar in the brick joints is surprising, the impression made being that of a white mass with the bricks imbedded in it rather than that of a red wall trimmed or outlined in its mass by white cornices and belt courses.

The porch at the end of the living room is shown with an open roof, suggestive of a pergola, a form easily covered with canvas for use in the summer, while in the winter it has the great advantage of allowing light and warmth free access to the windows behind it.

All porches, arbor, and balustrade to be wood, painted white to correspond with the terra-cotta in color without in any degree affecting it in substance and texture.

The color scheme is completed at the roof with tiles of brown shading to a suggestion of green, as a quiet topping out of the red house in its setting of grass and trees.

In the arrangement of plan the rooms have been so disposed as to gain the maximum of sunlight and air: the stairways and kitchen

with the latter the household suite during the summer time, and is well isolated at all seasons from the service portion of the house.

The second-floor plan provides four family bedrooms of good size, each getting a goodly portion of sunshine for a large part of the day.

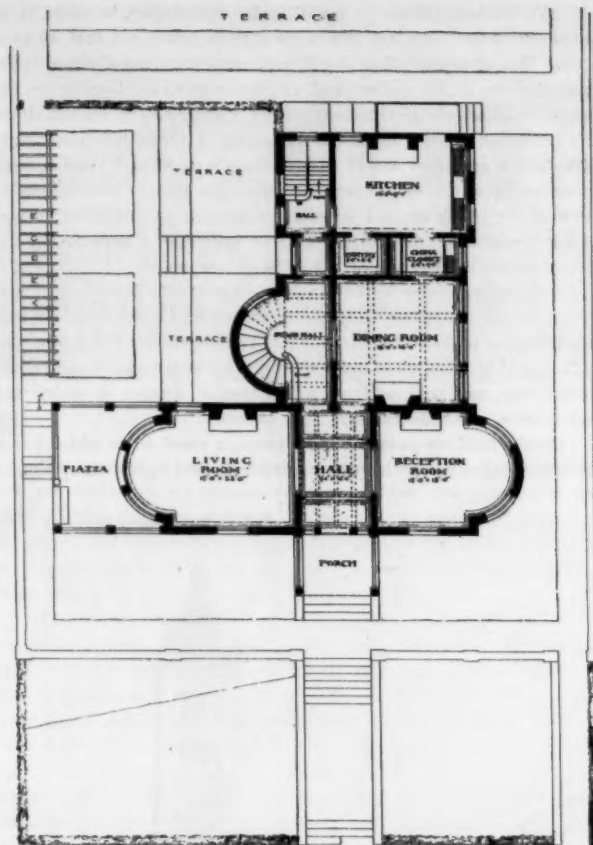
The bath room is accessible, and from the staircase arrangement is isolated from the lower hallway, a feature well worth striving for.

Servants are provided for in the roof story, a flat deck over the wide central portion giving space for two rooms.

In the basement there is space for laundry, servants' closet, furnace, storeroom, coal bins, etc., all well lighted from windows in walls across the front and on elevations not here shown, but which, from the fall in grade, will give light and air, and insure a dry, well-ventilated area under the entire building, with cement floors and lime-washed walls and ceilings.

The interior finish of our house must of necessity be plain and simple, nor is highly polished hard woodwork at all desirable here.

The hall and staircase and dining room may be of oak with the simple ceiling beams indicated, and each may be treated with a certain amount of paneled woodwork; the halls paneled to the height of the doors (the spaces are small) and the dining room wainscoted three or four feet high; the oak to be aged with acid stain, not filled, but finished with shellac and rubbed with wax. For the remainder of the house, painted finish with refined details gives



FIRST FLOOR AND GROUND PLAN.

elegance and home atmosphere in place of obtrusive and uncompromising polished wood.

The most satisfactory method of heating within reach is by means of a hot-air furnace with large pipes and registers to supply a goodly volume of warm air, rather than a smaller and more rapid delivery of intensely heated and frequently burnt air. No direct hot water or steam heating should be introduced in any part of a house other than in hallways, pantries, and perhaps bath rooms. A combination of direct and indirect steam or hot-water heating is most desirable, but involves an expenditure of too large a sum for a house of moderate cost. If care is taken to put in a furnace of large capacity that will do its work without forcing and scorching the air, a house may be kept at a comfortable temperature without difficulty. Every room in a house should have an open fireplace; not only is it a necessity in the cool of the spring and autumn before furnace fires are lighted, but in the winter a smoldering hearth fire helps out the furnace, and radiates cheery warmth and light, while the draught pulls air from the room, causing a correspondingly increased flow from the registers. Even where the fireplaces are not in use, the flue supplies an outlet for furnace-heated rooms and aids the draught from the registers, which cannot deliver air into a tightly closed apartment, thus insuring a circulation and constant change with a gratifying degree of purity. To insure success, careful attention should be given to the arrangement for supplying cold air to the furnace. If the air is brought directly to the heating surface by means of a cold-air box, the result when the wind blows into the duct will be quite different from the result when it blows from the opposite direction. In the one case, with a high wind it is difficult to supply enough warm air to the registers, as the damper of the box must be nearly closed or the air will be forced so rapidly over the dome of the heater that it does not become sufficiently heated; while in the other case, with a very cold wind blowing on

the opposite side of the house, the pressure down the registers from that side has been known at times to actually create a back draught through the cold-air duct. The most satisfactory method is to bring the air into a small brick chamber, carrying it by a galvanized iron duct to the smoothly cemented floor, and on the opposite side place the furnace connection. Such an arrangement eliminates the factor of wind pressure as far as it is possible to do so and has shown most uniform results in actual experiment.

It is well to add a partition 2 or 3 ft. in height across the cold-air chamber to intercept dust and dirt. Such a chamber may be made 4 or 5 ft. square, with 4 in. brick walls extending from the cellar floor to the ceiling, with an air-tight door for access from the cellar. Although this is no new idea, it is an arrangement not often found in dwellings using a furnace, and seems worthy of mention from the success the writer has met with in its use.

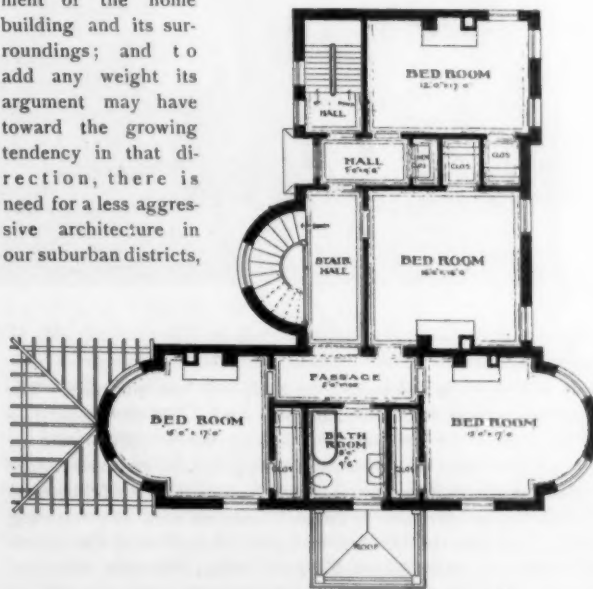
While not suggested as coming within the limits of the conditions of this article, a few words seem admissible here relating to the possibilities of solid floor construction even in houses of moderate outlay.

As the cost of rolled steel beams has been constantly decreasing, and will undoubtedly be quoted at still lower prices in the future, the comparatively small additional cost in masonry houses, of constructing the floors of the first and second stories of light steel beams and terra-cotta arches, renders the adoption of such a method perfectly feasible, and the gain in solidity, the absence of shrinking timber, and of resounding and springing floors, and the closing of air spaces to draughts and vermin, more than compensate for the additional expenditure, which would vary in different parts of the country, but at most should not exceed 5 per cent. of the cost of the house.

It will be seen on the accompanying plan that the substitution of brick for wood, in the single partition between the dining room and pantry, would give bearings for steel beams throughout.

There is little to be said about plumbing beyond the repetition of what has long been advocated and practised; the simplest possible arrangement of pipes open to inspection everywhere, the fewest possible fixtures, and the careful avoidance of all new and ingenious complications of traps and overflows for fixtures.

This article has been prepared in the interest of simplicity and refinement in the treatment of the home building and its surroundings; and to add any weight its argument may have toward the growing tendency in that direction, there is need for a less aggressive architecture in our suburban districts,



SECOND FLOOR PLAN.

that the house shall stand for that which is within, for the home which it covers, having no conscious air of wearing features whose only apparent purpose is that of attracting the notice of the passer-by.

Brick and Marble in the Middle Ages.

BY G. EDMUND STREET.

CHAPTER X.

"With all its sinful doings, I must say
That Italy's a pleasant place to me,
Who love to see the sun shine every day,
And vines (not nail'd to walls) from tree to tree
Festoon'd."
—Beppo.

Venice to Verona — Verona to Mantua — Villa Franca — Mantua:
its Churches and Palaces — The Theatre — Montenara — Campi-
tello — Casalmaggiore — Longadore — Cremona: the Cathedral
— Churches and Public Buildings — Lodi — Pavia: its Churches
— Castle of the Visconti — The Certosa — Drive to Milan.

OUR gondolier, anxious not to be too late for us in the morning,
slept in his gondola beneath our windows, and did his best,
when the sun rose, to rouse the sleepy porter of our hotel, but in
vain; and at last, when I awoke, I found we should have a very

We reached Verona at ten o'clock; the station, however, is so
much out of the town, and the day was so intensely hot, that we gave
up the idea of again going into it, and, contenting ourselves with the
general view of its quaint and picturesque walls rising over the
rugged hills which girt the city on its northern side, we sat down
to a breakfast of iced lemonade and some of those deliciously light
cakes which are never had in such perfection as in Italy, and amused
ourselves by watching the way in which the guards and drivers of
the train by which we had travelled proceeded to solace themselves
with a game at billiards, upon a table provided, I suppose, by the
very considerate directors of the railway company.

The railway from Verona to Mantua crosses a country which is
thoroughly uninteresting in point of scenery; it carried us on well
into the great plain of Lombardy, rich, teeming rich, in its produce,
but flat, arid, and sultry to a degree. This was altogether one of our
hottest days, and took us fairly into a kind of district in which the
heat is most oppressively felt.

On the road we passed Villa Franca, a small town which has a
rather striking castle, with battlemented walls and a good many square



ST. ZENO, VERONA.

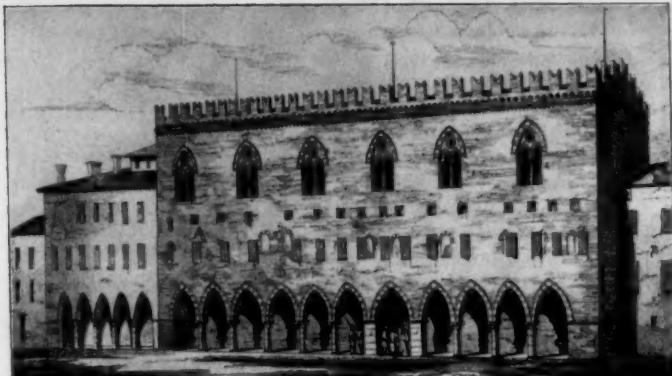
narrow escape, if indeed we did not absolutely lose our train. The
thing was, however, to be done, and was done. We shot rapidly —
only too rapidly for the last time — along the smooth waters on
which we had been so pleasantly loitering before, and soon found
ourselves at the railway station. Our journey was much like what
such journeys usually are: as far as Verona we were only retracing
our steps, but now the hot sun had quite cleared away the clouds
which, when we passed before, hid the Tyrolese Alps from our sight,
and these, whenever the high acacia hedges which line the railway
allowed us a sight of them, made the journey so far beautiful.

The names of the engines on this railway are very unlike the
kind of nomenclature indulged in at home; we were drawn to Verona,
I believe, by the Titian, and saw, as we rushed along, engines named
after Dante, Sansovino, and other artistic and literary celebrities.

towers, still very fairly perfect; the whole built in brick, and with battle-
ments finished square at the top, and not forked like those at Verona.

We reached the station at Mantua by twelve o'clock, but, as
this was very far from the city, it was nearly an hour later before we
were fairly landed at one — I forget which — of the abominably
dirty and bad inns to which sojourners within its walls have to sub-
mit with the best grace that they can.

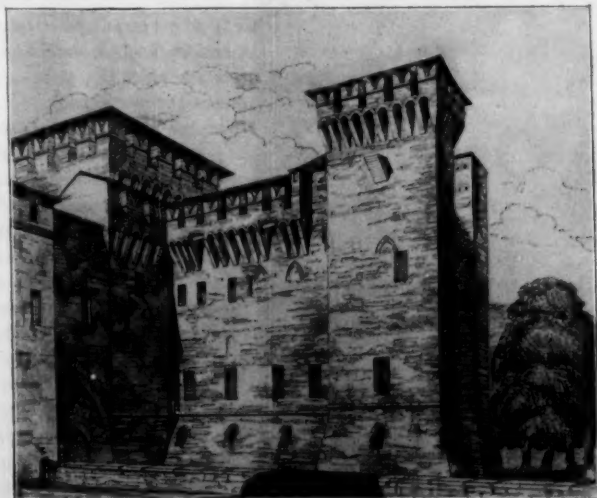
Mantua is nearly surrounded by water; two large shallow and
unwholesome-looking lakes giving it this far from pleasant kind of
isolation. Over a long mediæval bridge between these waters the
way into the city from the terminus lies. One of the lakes is higher
than the other, and accordingly twelve mills, each adorned with a
statue of an apostle, are formed upon the bridge, and give it its
name of Ponte Mulina.



DUCAL PALACE, MANTUA.

The general aspect of Mantua is very dreary and unpleasing, not less forlorn in its appearance than Padua, and possessing but little attraction for an architect. The chief architectural feature of the city is the Ducal Palace, which contains, in the midst of a mass of Renaissance work of the poorest and most unsatisfactory kind, some very good remains of pointed architecture.

The finest portion is a long building of vast height, and retaining more or less of Gothic work throughout, but especially remarkable for the range of windows in its upper stage. Its front faces on one side towards the Piazza di San Pietro, and on the other with a very nearly similar elevation towards the Piazza del Pallone, one of the courts in the vast palace of the Gonzagas, of which it forms a part. This building is said to have been commenced about A. D. 1302 by Guido Buonacolsi, surnamed Bottigella, third sovereign of Mantua, and this date quite agrees with the character of all the detail. The interior has been completely modernized, mainly by Giulio Romano, who carried out very extensive works in other parts of the palace. The windows in the upper stage of this portion of the palace deserve notice as being about the most exquisite examples of their class that I anywhere met with, though those in the campanile of Sant' Andrea, hard by, are only second to them. The main arch is of pure pointed form, and executed in brick with occasional voussoirs of stone—one of which forms a key-stone—and over it there is a label of brick effectively notched into a kind of nail-head. The same kind of label is carried round the arches of the window-openings, and down the jamb as a portion of the jamb-mould, and again round a pierced and cusped circle of brick in the tympanum.



CASTELLO DI CORTE, MANTUA.

In the sub-arches the key-stones and cusps are formed of stone. The whole of the jambs are of brick, but instead of a monial there is a circular stone shaft, with square capital and band and base. The whole is so exceedingly simple as to be constructed with ease of ordinary materials, and it is quite equal in effect to any stone window of the same size that I have ever seen.

The accompanying drawings will, I trust, sufficiently explain the merit of this magnificent piece of brickwork. The arcading upon which it rests, and the perfectly unbroken face of the whole, are very characteristic of Italian work.

On the opposite side of the Piazza di San Pietro is the cathedral, the only ancient portion of which is a small part of the south aisle. It is of very elaborate character, entirely built in brick, and so far as it remains appears to have been part of an aisle finished with a succession of gables, one to each bay, a common arrangement in German and French churches, where additional aisles are so frequently met with, but uncommon in Italy, where, as in England, churches have seldom more than one aisle on either side of the nave.¹ The brickwork in

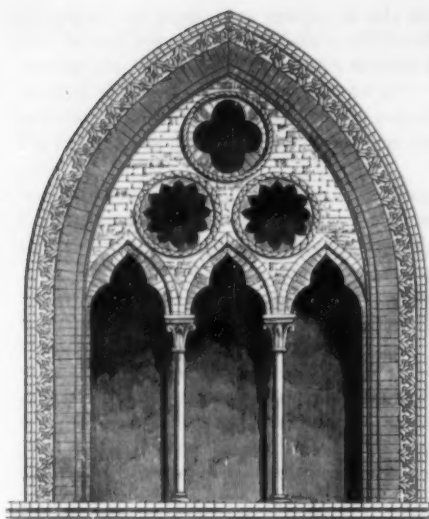


WINDOW IN DUCAL PALACE, MANTUA.

this small fragment of the cathedral, though elaborate, was not pleasing, being of rather late date.

On the same side of the Piazza as the cathedral is the Vesco-vato, a large pile of ancient building, but very much modernized. There still remain, however, some good three-light windows in the upper stage, inclosed within a circular arch, without tracery, and divided by marble shafts. Some old arches remain also in the lowest stage, which, though now built up, are still valuable as examples of the best mode of treating brickwork. They consist of three orders—the two inner formed of alternate voussoirs of brick and stone, carefully and regularly counterchanged, and the outer of a moulded terra-cotta ornament. Between each of these lines a brick of deep red colour is set edgewise, shewing a dark line of little more than an inch and a half in width, and valuable as very clearly defining the lines of the arch. All these courses are on the same plane; and probably another rim of the arch is concealed by the walling which has been filled in underneath.

¹ It is to be seen, however, in the church of San Petronio, Bologna.



BRICK WINDOW, SANT' ANDREA, MANTUA.

careful inspection. The heavy machicolations which run round the main building have a peculiar and rather grand effect, particularly in the flanking towers. This portion of the palace is said to have been erected just at the close of the fourteenth century.

Close to the Castello di Corte is the Ponte di San Giorgio, one of the entrances to the city, and built between the Lago di Mezzo and the Lago Inferiore.

Retracing our steps, we soon found ourselves at the great Palazzo della Ragione, or town-hall. It has been very much altered, but one gateway remains in a very perfect state, and is quite worthy of illustration. The marble shafts in the upper stage of the building are coupled one behind the other with very beautiful effect. Brick and stone are used alternately in the main arch of this gateway, with thin dividing lines of brick, as in the Vescovato. In a wall close to the gate is a sitting figure, intended, it is said, to represent Virgil, of whom the Mantuans are still, as in duty bound, very proud. I cannot say much for the figure or its canopy, both of which are, however, mediæval.

We found nothing else worthy of notice in this building; but close

Going on from the Piazza San Pietro, and passing under an archway, we came upon the Castello di Corte, also a part of the ancient palace of the Gonzaga family, who were for a long time lords of Mantua. It is certainly a very remarkable piece of mediæval fortification, but its effect is much damaged by the erection of walls between the battlements, which in my view I have thought it much better to shew in their original state, which is evident enough upon

to it stands the church of Sant' Andrea, a hideous Renaissance edifice tacked on to a most beautiful brick campanile.

The detail of this is throughout very fine. The tracery is all of a kind of plate-tracery, consisting, that is to say, of cusped circles pierced in a tympanum within an inclosing arch; the shafts between the lights are of polished marble, and coupled one behind the other. The relative proportion of the cusps in this and in most other Italian buildings is very good. In trefoils, for instance, the upper cusp is usually smaller than the lower; and in all good cusping it must be so. Modern men generally reverse the order, and, at the present day, so little is the subject really understood that at least ninety-nine out of every hundred cusped window-openings are designed without feeling, and quite unlike the best old examples; and this, though apparently a point of very small importance, is really of great consequence to the perfection of any pointed work.

The faulty portions of this campanile are the elaborate arcadings in brick beneath the string-courses, and the awkward and abrupt manner in which the octagonal stage and the round tile spire are set upon the square tower. The present appreciation of the building by the good people of Mantua is shewn by the opening pierced in its lower stage, in front of which the modestly withdrawn folds of a green curtain disclose the interior devoted to a barber's shop, and in which the patient, seated in the middle of the shop, and looking into the Piazza, submits to the painful operation of shaving — a common picture in almost every street of an Italian town, but not pleasant when the place is a portion of a church.

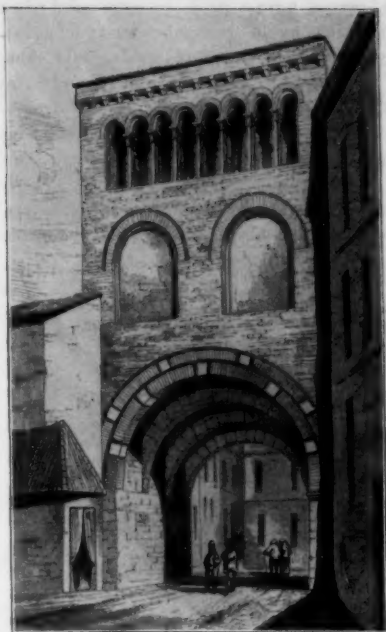
The guide-books speak of the church of Sant' Andrea as "among the finest existing specimens of an interior in the revived Roman style." If it really is so, I advise all architects interested in the failure of the said style to venture, notwithstanding the forbidding west front, into the nave, when they will perhaps find comfort in seeing how miserable a building "one of the finest" of



BRICK WINDOW, SANT' ANDREA, MANTUA.



CHURCH OF SANT' ANDREA, MANTUA.

GATEWAY, PALAZZO DELLA RAGIONE,
MANTUA.

In Mantua there are two or three other churches with brick campanili, but they are very inferior in their character to that of Sant' Andrea, and hardly worth special notice. We owe it to the French that there are not more interesting churches, for, having succeeded in capturing the city after a very prolonged siege, they sacked it, and are said to have destroyed no less than about fifty of them.

Here, as elsewhere in this part of Italy, most of the streets are arcaded on either side, affording pleasant shelter from the hot sun, but every twenty yards we come upon one of an unpleasant class of shops, in which cheese, oil, and the like comestibles are sold, with most objectionable effects on all people blessed with noses.

In the evening we found an Italian performance going on at the theatre, and so thither we went, anxious to see how far Italian comedy might be amusing. I fear our inquiry was not much to our edification, for the favourite performers were mainly remarkable for the prodigious rapidity with which they uttered their facetious sayings, and so we lost more than half the dialogue. The theatre was almost entirely filled with Austrians, but still there was a sprinkling of Italians among them, which did away with the absurdly martial appearance of the only other theatre we had been into—that at Verona.

The next day was Sunday, but we were obliged to push on; and so, resigning ourselves to the diligence which left Mantua at about nine, we booked ourselves for Cremona, under the promise that we should be delivered there punctually by five o'clock.

We lost sight of Mantua almost immediately, for, travelling along a dead flat and by roads whose sides are lined with high hedges of acacia or orchards thickly planted, you never see any place or building until you have absolutely arrived at it. There was not much to interest me on the road, and the weather, at first cloudy only and sultry, gradually became worse, and, before we had gone far, settled into a steady pouring rain; so we read, wrote, and occupied the many hours in the rumbling diligence as best we might.

At Montenara, which we passed on our road, the church has a

its class may nevertheless be!

The people at Mantua seemed to be excessively disturbed by my attempts at sketching, and at Sant' Andrea they mobbed me so thoroughly that I was really beginning to think of giving up the attempt in despair, when a kindly-disposed hatmaker, seeing my distress, came down to the rescue, and gave me and my party seats in a balcony on the first floor of his house, in which, sitting at my ease above my persecutors and listening to the good man's wife and daughters, I finished my sketch with great comfort.

brick campanile, with pilasters at the angles, and in the belfry two-light windows, with marble central shafts and round arches. It has one of the usual brick conical spires, with small angle-pinnacles—a finish to these campanili which certainly does not improve upon acquaintance. They are constructed of bricks with semicircular ends laid side by side, the joints being broken in each course, and so making a very jagged kind of cone.

The only noticeable point about the church at Montenara is that it has been lately rebuilt in the very worst taste, and at an angle of forty-five degrees with the old steeple!

At Campitello there are several remains of interest. There is a small domestic building, with four pointed windows of two lights at the side; the windows have central shafts of stone, but are otherwise entirely of rough brickwork. The church has a kind of double belfry-stage, arcaded similarly in each stage with round arches. There are also here the remains of a castle by the river, with a fine tower of the same type as the angle-towers of the Castello di Corte at Mantua, and covered with a very flat-pitched roof.

At Casalmaggiore, a town of some importance on the Po, we stopped for dinner; but it was too wet to attempt to look at the river, and the only note I made was of a large new church now in course of erection, Renaissance in style, and with a large dome, and a choir and transepts, all terminated with circular ends. The redeeming feature about it was that it was entirely constructed in brick with considerable care, though probably ere long this will be covered with a coat of plaster, of which modern Italians are not one whit less enamoured than are modern Englishmen.

At a village, the name of which I did not learn, between Casalmaggiore and Cremona, the church had a remarkably good simple brick campanile. The belfry windows were pointed, of two lights, with a small pierced circle in the head, the shafts being of stone of course. Beneath the string-courses there was arcading, and the tower was finished with three forked battlements of the Veronese type on each face, and behind these rose a circular brick spire.

This tower was to the south-east of the church.

At Longadore we saw another church with a good early campanile, of which I made a sketch. This was Romanesque, with angle pilasters, and a central pilaster carried up as high as the belfry-stage. The belfry windows were of three lights and shafted. The battlement was most peculiar—a quarter circle at each angle and a half circle in the centre of each side, with a narrow space between them; the whole executed in brick and covered in with a flat modern roof. The angle pilasters finished under arcaded string-courses. Generally speaking, in these churches the only ancient features seem to be the campanili, and these are always of brick and nearly similar in their general design, with pilasters at the angles, a succession of string-courses—generally arcaded underneath—and windows in the belfry-stage only.

It was quite six by the time we reached Cremona, and, depositing our passports at the gate, we trotted on along the smooth granite (which in these towns is always laid in strips between the rough ordinary paving for the wheels to travel on), and after traversing a long tortuous street, and getting a glimpse only of the cathedral as we passed near its east end, we were soon deposited at the Albergo del Capello, a comfortable hostelry, which we enjoyed the more by contrast with the miserable quarters with which we had to put up at Mantua.

(Continued.)



BRICK WINDOW, CAMPITELLO.



BRICK WINDOW, NEAR CASALMAGGIORE.

Fire-proofing.

RECENT IMPROVEMENTS IN THE MANUFACTURE OF FIRE-PROOF BUILDING MATERIALS FROM CLAY.

IN THE BRICKBUILDER for June, 1897, while commenting on the effects of fire and water on the fire-proof Horne Office Building at Pittsburgh, on May 3 of that year, the following sentences ap-

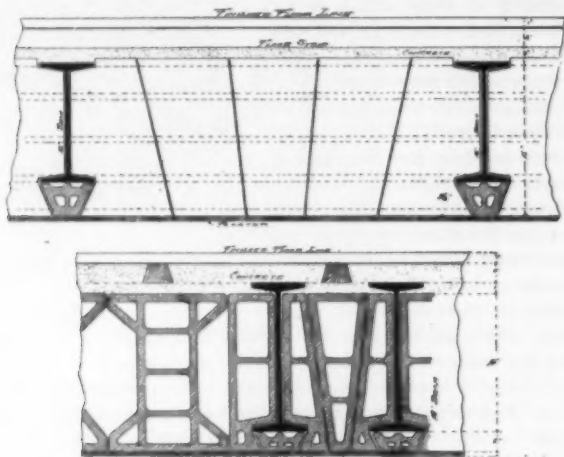


FIG. 1.

peared: "The fire-proofing material throughout is semi-porous red clay hollow tiles." "The fire test in the building showed that heating, wetting, and cooling did not destroy the structure of the material, as is sometimes the case with very light porous terra-cotta made of plastic fire clays." "The value of semi-porous tiles was completely demonstrated in this fire." And in August of the same year THE BRICKBUILDER said, in an article on "The Details of Fire-proof Construction": "The use of porous, and not semi-porous, terra-cotta is recommended for inert or protecting material, when

used solid, while the semi-porous terra-cotta is recommended when used in the hollow form." Later, in the November issue, in an article on "The Present Condition of the Art of Fire-proofing," the value of a method for finishing the ceilings of fire-proof buildings with independent flat tiles, and the fact (which has been repeatedly demonstrated by experience) that if such tiles were made by splitting hollow tiles, after burning, they would not crack when exposed to fire and water, were set forth at considerable length.

Since then, THE BRICKBUILDER has anxiously watched to see if any advantage would be taken of these suggestions, and the result

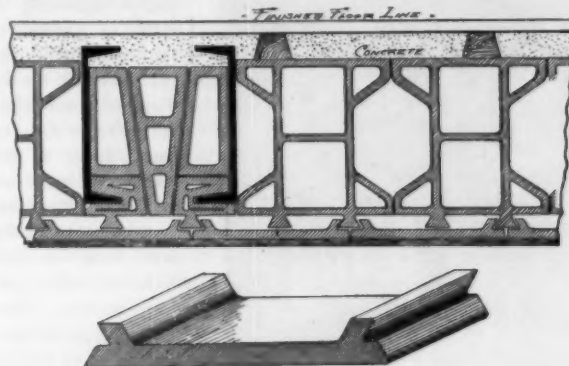


FIG. 2.

in one instance is highly gratifying. Upon inquiry it was found that the Pioneer Fire-proof Construction Company, of Chicago, had since then not only experimented with, but put in practise, some of the recommendations of THE BRICKBUILDER. We therefore sought an interview with Charles F. Eiker, the general manager of the company, who has prepared the accompanying illustrations, which, to a certain extent, furnish replies to some of the questions addressed to architects in Chicago, as given in our August and September issues.

In answer to an inquiry as to what had been their practise in preparing and mixing clays, Mr. Eiker said: "Up to five years ago we used only the crude clay as it came from our mines, which was ground in dry pans tempered with water and put through our presses ready to dry and burn. If we used any grog, which, as you know, is rejected tile ground to a powder, it was without any system, and most of our rubbish pile was used for filling in low ground. I need not add that, according to this way of doing things, the quantity of imperfect material that could not be used commercially and went to the dump was very large. We have since then improved the hard product by a more systematic use of grog, have thereby decreased the waste, and have found this to be more economical in the long run.

"In 1893 we commenced experimenting with sawdust and ground coke for the purpose of making our material more porous and less brittle. We knew that our fire clay, which is very 'short,' would not make what is called porous terra-cotta. Since the great fire in Pittsburgh, in May, 1897, and after reading your comments upon it, we became convinced that the best material for all purposes was semi-porous terra-cotta, and renewing our experiments, we set about to make it as perfect as possible with the materials at our command. The result is that we are now making and using it in our contracts.

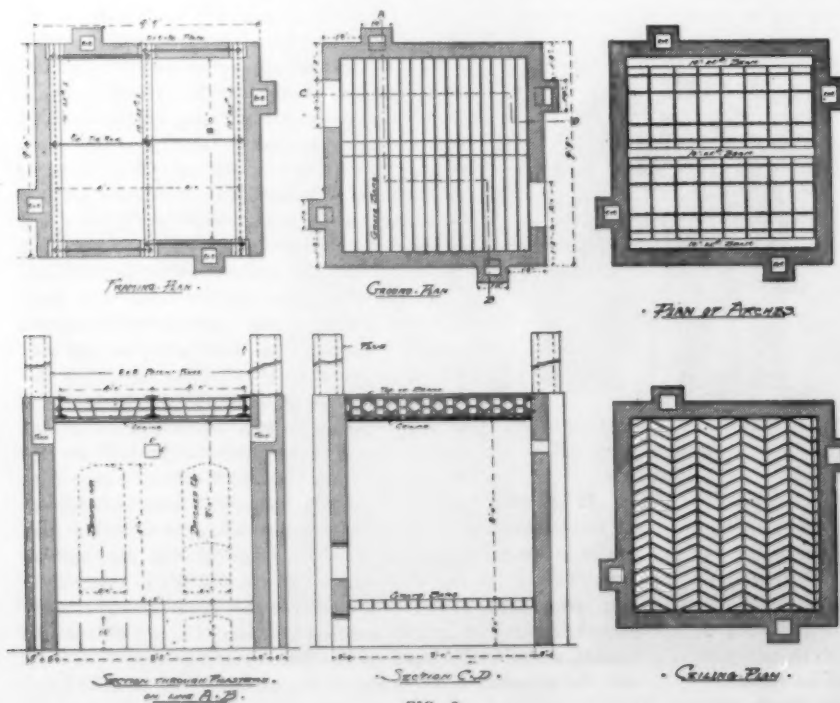


FIG. 3.



FIG. 4.

We use our fire clay finely ground in dry pans as a basis. With this we mix a small amount of ground shale to make it plastic, a proportion of grog to make it burn true and straight without cracks, and pulverized bituminous coal. We had to abandon both sawdust and coke. Of course the proportions in which we use these materials are our own property, and would not apply to any other clay. Our composition is the result of numerous experiments, for conducting which we constructed a small experiment kiln. We formerly made the hard tile as thin as it was possible to run it from the dies and burn and transport it successfully. It was necessary to do this to meet competition, reduce freights and handling, and to comply with the demand of the architects for a light material to be used in high buildings. Now that we are able to make the body of the material lighter, we have increased the thickness of the walls of the tiles about 25 per cent. to insure greater toughness and strength. We, as well as the architects, once thought that thin walls were best in hard tile, because the heat-resisting quality was found in the air cells. But the new material is also more nonconducting, and there is not only no objection but a great advantage in making the walls thicker, as you have already suggested. We still keep down the cost of transportation as well as the weight."

Q. "What is the relative expense of the new material compared with the old?"

A. "It is slightly greater. The cost of the materials used and the labor employed are considerably more; but there is a reduction in fuel, and the very slight loss from imperfect material offsets this to a considerable extent. Instead of having great piles of useless material, we have just enough now to grind up for 'grog.'"

Q. "How are you satisfied that this material is better than the old?"

A. "We have built a test house at our works at Ottawa, and have subjected it to repeated tests to demonstrate its value under the conditions which demonstrated the weak points in hard-tile constructions as developed in recent fires in fire-proof buildings."

Q. "Has this material been used in buildings during the past year, and if so, where, as we want to observe the results in case any of them should be subjected to an actual test?"

A. "It has been used in the State Street addition to the Fair Building, the addition to the New York Life Building, the Carter

Building, and the Strong Building, all in Chicago. We use the same material for all purposes, and do not confine it to floor arches."

The illustration here given (Fig. 1) shows two vertical sections of the latest pattern of end-pressure floor arches made by the Pioneer Company. The upper one is a section through the beams, and the lower one a section through the girder. It is intended for a construction of double 15 in. I beam girders set far enough apart to pass outside of the continuous steel columns. The 12 in. I beams are framed to the sides of the girders, without necessitating any coping of their flanges. The arches are 16 ins. deep, and the under side, forming a flush ceiling, is $3\frac{1}{4}$ ins. below the beams and 2 ins. below the girders. This provides for a soffit tile under all beams and girders that can be made with two air spaces. Only two buildings have been heretofore erected in Chicago with 3 in. hollow soffit tiles under the beams: the Western Union Telegraph Building and a wholesale store on Fifth Avenue. The girder, according to this construction, is treated similarly to those of the New York Life Building, as already described in THE BRICKBUILDER for July, the protection being independent of the floor construction, though both are flush at the bottom. The floor arches are built entirely of tiles of one section, including the skew-backs, and cut so as to occupy their respective positions, the joints radiating from a common center. Mr. Eiker says that this arch can be safely set, for office buildings or retail stores, to a safe span of 10 ft. No concrete is used except as ballast for the floor sleepers. Being made of semi-porous tile, the walls are made 1 in. thick. Attention is called to the fact that in these sections of tiles there are no sharp angles on the inside of the cells, which are the points at which arch tiles have been most liable to crack. The angles are rounded, with a radius of about $\frac{1}{2}$ in., which Mr. Eiker claims as the result of tests showing that tiles of this section can be successfully dried and burned. This illustration (Fig. 1) is taken from the detail drawings of the floor construction of an important building now under consideration.

Fig. 2 is a section taken across the girder of a floor construction parallel with the beams, and adapted to the form of steel work used in the New York Life Building (see July BRICKBUILDER). It shows how the system of ceiling protection suggested in THE BRICKBUILDER for November, 1897, can be applied to flat end-pressure arches.



FIG. 5.

The Pioneer Company has constructed a section of floor and ceiling according to this detail in their test house at Ottawa, Ill., and subjected it to a very severe private test for their own satisfaction. The tiles forming the arches are run with two projecting dovetails on the bottom of each. The alternate dovetails are used for securing ceiling tiles which have been burned in couples and split apart. One of these is shown enlarged under the section drawing (Fig. 2). They are cut off diagonally so as to have a lozenge shape. This makes it possible to insert them between the dovetails with a small amount of mortar on each edge. These tiles when plastered are subjected to the full effect of fire and water, and have an air space behind them for the protection of the bottom of the arch. If they should fall in case of an actual test they can be easily and cheaply replaced, which would not be the case if the bottoms of the arch tiles should be cracked off. Thus the use of them avoids the necessity for resetting any of the arches. It has been demonstrated repeatedly, as described in these pages, that such flat tiles will resist fire and water better than hollow tiles. The Pioneer Company claims to have proved it, as will be seen hereafter.

To make this plain, we reproduce the drawings of their test house, with such a construction in position, which are shown in Fig. 3. This has many interesting features which seem to make it superior to that used by the New York Department of Buildings. The drawings are in the main self-explanatory. The "Plan of Arches" shows where the joints of the end-pressure arches are seen from the top, while the "Ceiling Plan" shows the ceiling tiles in position under the arches. A further description of this house and the test of tile-protected arches will be given in Mr. Eiker's own words:—

"The test house is very similar to that which was constructed two years ago by the New York Department of Buildings to determine the relative values of fire-resisting systems of floor construction used in that city. We think we have improved on that one by the introduction of two additional flues. Engineers of reputation have advised us that this is the only way to get a proper and uniform fire test. The building was completed Dec. 15, 1897, and the test of the protected flat-arch system was made in the latter part of December. The flat arches and furring tiles on the ceiling were set as shown on the drawings, and as I have described to you, all having been made from special dies made for the purpose, and the side walls were furred with $1\frac{1}{2}$ in. split tile, all the material being our semi-porous terra-cotta. The upper surface of the arches was covered with wooden sleepers ballasted with concrete and covered with such a wooden floor as is generally used in office buildings. There were four 'peep holes.' Opposite one of them, on a shelf made of cast iron, were placed a piece of glass, a piece of brass, and another of copper. Each of these was melted in turn as the required temperature was reached. The fire was continued until the cast-iron shelf melted, when the 4 ins. of brickwork over the two fire doors was torn down. A 1 in. stream of cold water at a pressure of 50 lbs. to the square inch was thrown in until the whole was cooled sufficient for examination. I do not claim that this was such a test as scientific men might have made, but it suited us. The result showed that no wall furring had been broken or dislodged, and only three pieces of ceiling tile fell. They were immediately in range of the stream of water, and it appeared as if the joints had first been washed out and the tiles pushed away by the force of water. They were picked up unbroken. The photograph that I have shown you (Fig. 4) was taken after the test; the other one (Fig. 5) shows the outside of the test house. This building is still standing and will be used whenever we have occasion to make tests for ourselves or put to the service of any one who may desire to do so, to find if any new facts can be discovered."

In answer to a question, Mr. Eiker said that the fuel used was dry pine wood only. It was replenished through the two low iron doors, one of which is shown in Fig. 5. Over each of these was a sheet of iron with 4 ins. of brickwork built outside of it and so fixed that by pulling the sheet the whole would fall at once. The fire was maintained from 11 A. M. to 3 P. M. for this particular test.

Masons' Department.

SOME MISTAKES OF CONTRACTORS AS VIEWED BY AN ARCHITECT.

BY F. E. KIDDER.

IN the nature of things, there will always be a difference of opinion as to the wisest manner of conducting a given business and the methods to be pursued to gain the desired end. There are, also, and the writer deems it a misfortune, different ideas as to what constitutes success in business, although most people will agree that a certain amount of financial gain must be produced before one can call himself successful as a business man.

Assuming that a successful contractor is one who so conducts his business as to provide a comfortable living for himself and family, and to increase to a reasonable degree his original capital of goods and money, and to a large degree his reputation for good work and satisfactory execution of his contracts, the writer proposes to speak of a few of the things done, or neglected, by building contractors which appear to be in the nature of mistakes, that might to a large extent be avoided.

The first of these, both in point of order and in the consequences to the contractor, is that of *bidding too low*. It is certainly the opinion of most architects that contractors make a very serious mistake when they submit a bid that will not enable them to come out "whole" under any contingency, or with probable conditions allow a reasonable profit. The greater the risk, the greater also should be the margin allowed for profit.

Many contractors appear to think that they are doing the architect a favor when they put in a low bid, and although this may be so in special cases, it certainly is not so in the general run of work; and whether it be so or not, it is not the duty of the contractor to look out for the interests of the architect, in this particular, at least. As a rule, owners will finally either pay a reasonable price for what they want, or will take what they can get for their money, and that they should do so is beyond question.

To submit a low bid to help out the architect, and then expect him to "let up" on the work, is not only a great mistake, for which one deserves to lose, but verges on dishonesty.

That contractors, as a body, recognize the great evil of low bidding and have tried in various ways to prevent it is well known, but, as a rule, the schemes that have thus far been tried have not proved successful. The writer doubts if any scheme of prevention will ever be successful for any length of time, and believes that the only effective remedy is for each contractor to recognize that he is injuring himself when he puts in a low bid.

That contractors also make a mistake in bidding too high is also true, but this is a mistake that seldom occurs except in individual cases. A mistake frequently made by ignorant or careless contractors is that of making their bid according to the figures, either real or alleged, of some other contractor, and in connection with it is, perhaps, the greatest mistake of all: that of not recognizing one's own ability, and attempting a business for which one is not equipped, either mentally or with experience or capital.

The writer has known of many cases where a contractor has learned that another contractor has offered to do a piece of work for a certain sum, and has then put in a bid a little lower, without really knowing whether the work could be done for that amount or not. In not a few cases misleading bids have been quoted, and the contractor using them has been badly "stuck." A person that cannot estimate with reasonable accuracy the probable cost of work indicated by proper plans and specifications certainly cannot expect to become a successful contractor, although he may be a good workman.

Herein lies also a common mistake of foremen, or those who expect some day to enter the ranks of contractors, viz., that they neglect to observe carefully the cost of doing different kinds of work, the labor and materials required, and of making proper records of the same for future use.

When it comes to filling out and signing the contracts, the contractor not infrequently accepts conditions that he knows or ought to know will impose a hardship upon him, and in some instances, if strictly enforced, may cause him a considerable loss.

Until a contract is signed, it may be changed or modified, but after the signatures are affixed it can only be modified by the consent of both parties, and by that of the surety, if there is one.

The particular conditions of a building contract that may not be fair to the contractor are those relating to the payments and to the time allowed for completing the work.

A contractor cannot be expected to sign a contract unless the terms of payment are satisfactory, although it is fair to presume that he will be satisfied with the usual conditions of such agreements. Not infrequently, however, an owner will endeavor to hold back an unduly large percentage of the contract price until some time after the work is completed and accepted.

If the contractor has sufficient capital or credit to carry on the work under these conditions, it may pay him to accept them; but if he has not, and cannot pay his bills promptly with the amount of money coming to him, he should say so, and insist on better terms, and in most cases they would be granted.

The owner is usually as anxious to accept the lowest bid as the contractor is to do the work, and the latter should not be afraid to insist on terms as favorable to himself as to the owner. The same is also true in regard to the matter of time. Contractors undoubtedly know that it is hard to make a forfeiture clause "stick," but it is sometimes enforced, and the writer believes that it is a decided mistake to go on the principle that it will be "got around" some way.

It is much better to insist on the time necessary to do the work, with proper allowance for bad weather, delays, etc.

Again, many contractors expect the architect to see that their interests are looked after in drawing up the terms of the contract. Reliance on this is not always safe, nor is it quite fair to the architect. Until the contract is signed the architect bears much the same relation to the owner that a lawyer does to his client, and no one would expect a lawyer to advise the other side.

The contractor, therefore, should look out for his own interests, even at the expense, if necessary, of consulting an attorney, and he should be sure of what is in the contract before he signs it.

The writer has known of several instances in which contractors have bound themselves to do more than they intended, through carelessness in reading the contract or specifications, which are considered as a part of the contract. After the contract is signed and the work commenced, the relation of the architect changes somewhat, being more that of a judge between both parties, but he is also to a certain extent the agent of the owner; and as the faithful agent must ever have at heart the interest of his employer, he cannot be expected to look after that of the contractor. Most architects also desire to have the work done as well as possible, and the natural tendency is to impose on the contractor rather than to favor him, which makes it all the more necessary for the contractor to stand up for his rights.

(Continued.)

A CORRECTION.

EDITORS OF THE BRICKBUILDER.

Dear Sirs:—By some slip of the pen, I spoke of a working day of twelve hours, in my article on "Estimating Brickwork," September number, thirtieth line, second column. It should have been eight hours.

Yours truly,

F. E. KIDDER.

Brick and Terra-Cotta Work In American Cities, and Manufacturers' Department.

NEW YORK.—In April we predicted that by this time business would be in a healthy condition, provided that the war was settled, and in most lines of business this prediction has been fulfilled; but in regard to building operations it is now too late to begin any edifice of large size so that it will be well under way before winter. Consequently there is very little new work of any consequence to report, although we have heard of several important buildings now being planned, but not to be built until spring. A number of architects have been busy with small cottages, some of them brick, but the majority built in the regulation way, viz.: brick foundations to line of water table, first story clapboards, and shingles above.

The English half-timbered style is rapidly growing in popularity, and the prettiest examples of it that we have in and around New York are built with the first story and terraces of dark red brick, with the half-timbered work above. This makes a pleasing contrast of color, besides adding much to the stability of the structure.

The following items of new work have been reported:—

C. P. H. Gilbert, architect, is preparing plans for a five-story,



TERRA-COTTA PANEL, SCHOOL NO. 7, BAYONNE, N. J.

Executed by the New Jersey Terra-Cotta Company.
Hugh Roberts, Architect.

fire-proof brick and stone residence to be built on 79th Street, between Fifth and Madison Avenues, at a cost of \$125,000.

James E. Ware & Sons, architects, have prepared plans for a six-story brick, stone, and terra-cotta apartment house, Central Park, West, near 94th Street; cost, \$100,000.

Schneider & Herter, architects, have planned two five-story brick and terra-cotta stores and flats to be built on 100th Street, corner Second Avenue; cost, \$40,000.

Clarence F. True, architect, has prepared plans for six five-story brick and stone dwellings to be built on Riverside Drive near 83d Street; cost, \$150,000.



IMPOST CAP, MAIN ENTRANCE, CAXTON BUILDING, CLEVELAND, OHIO.

Executed by the Northwestern Terra-Cotta Company.
F. S. Barnum & Co., Architects.

C. P. H. Gilbert, architect, is at work upon plans for a seven-story brick and stone fire-proof office and studio building to be erected on Fifth Avenue; cost, \$185,000.

Chas. E. Reid, architect, has prepared plans for a six-story store and tenement building to be erected on Oliver Street; cost, \$50,000.

Farnsworth & Miller, architects, have planned a three-and-one-half story brick dormitory for the New York Catholic Protectory; cost, \$40,000.

N. C. Mellen, architect, has planned a three-story brick store and studio building to be built for the Cameron Company, on Fourth Avenue, corner 19th Street; cost, \$160,000.

Buchman & Diesler, architects, are preparing plans for a six-story brick store building to be erected on Houston Street, at a cost of \$50,000.

Three warehouses, built of brick and iron, and costing about \$150,000 total, are soon to be erected in the Government Navy Yard, Brooklyn.

Edward Wenz, architect, has planned five four-story brick and stone flats to be built on Franklin Avenue, corner 168th Street; cost, \$105,000.

CHICAGO.—The building trades have been much interested in the recent controversy between Mr. Downey, of the Board of Education, a contractor of long experience, and Mr. N. S. Patton, architect of the same board, and a man of no less experience in his own line. Mr. Downey introduced a motion compelling the use of a certain make of bricks to the exclusion of all others, and this motion was vigorously opposed by Mr. Patton, both for architectural reasons and also because it seemed to grant a monopoly to one favored firm. The brick manufacturers have entered protest against the Downey resolution; but the school board have gone so far as to order Mr. Patton tried for "insubordination." Mr. Patton is President of the Illinois Institute of Architects and stands high in Chicago. Mr. Downey was formerly Commissioner of Public Works. Hence the controversy, and the "trial" is given prominence by the daily press.

Questions affecting schoolhouse construction are of deep inter-

est in Chicago just now, when the constant increase of school population is calling for so many new and enlarged school buildings. One of the newest for which plans have been drawn is the Dewey School to be erected at 54th Street and Union Avenue. Its exterior is of pressed brick and cut stone, and its interior fittings are most full and complete, the whole cost being \$90,000.

New buildings are being erected on the site of the disastrous fires of last March, and it is to be noted that special precautions are being taken as to fire protection and sufficient elevator service. The Ayers Building on Wabash Avenue will have a front of white glazed terra-cotta and will be nine stories high. The

Schoemmann Building, on which but little work has yet been done, is to be specially constructed for the carrying of heavy printing presses, and will have a front of stone and pressed brick.

Jenney & Mundie are the architects for a new twelve-story office building to be erected on the site of the National Life Building on La Salle Street. This is between the Association Building on the north of Arcade Court and the New York Life Building on the south of an intervening alley, and the fact that the interior walls of the latter building are of enameled brick and the former light-colored brick will afford much additional light to the interior of the new building.

The Western Methodist Book Concern will build a ten-story building on its lot at 57 Washington Street, from plans drawn by



HEADS FOR A BUILDING, MARKET SQUARE, WASHINGTON, D. C.

Executed in gray terra-cotta by the Excelsior Terra-Cotta Company.
T. F. Schneider, Architect.

Architect H. B. Wheelock. Mr. Wheelock also has planned a new structure for the wholesale region of Chicago, a warehouse on Market Street, which is to have a front of pressed brick and terra-cotta. Also at Canal and Jackson Streets an eight-story fire-proof building is being constructed, its exterior being of red pressed brick with stone trimmings.

A new Union Station is being built at Englewood, one particularly adapted to the elevated roadways of the four railroads, and also the electric service in the subway.

The Midlothian Country Club, Frost & Granger, architects, has just been completed. It is colonial in style with very ample accommodation in every line.

The Rock Island Road has also erected a new depot at the station about a mile from the club house, conforming in style of architecture to that of the club house.

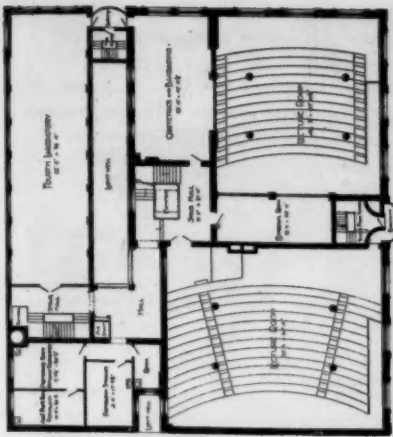
ST. LOUIS.—There is considerable complaint of dulness among architects and builders, although there is, beyond question, indications of improvement, which are quite likely to continue, and doubtless the beginning of the year will see the opening up of a good business.

Real estate has become more active, and capitalists are offering money for investment at lower rates of interest. This, together with the general expanding and shifting of commercial interests, gives considerable encouragement.

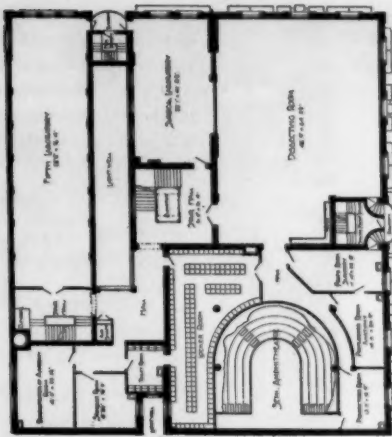


PANEL OVER THIRD STORY, BAYARD BUILDING, NEW YORK CITY.

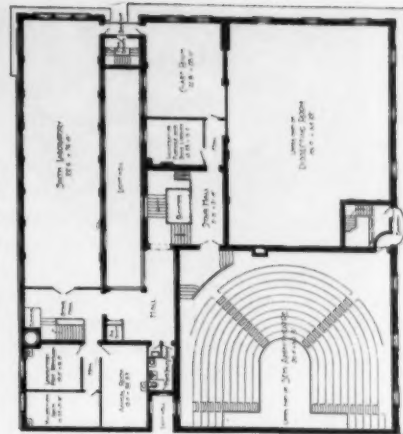
Executed by the Perth Amboy Terra-Cotta Company.
Louis H. Sullivan, Lyndon P. Smith, Architects.



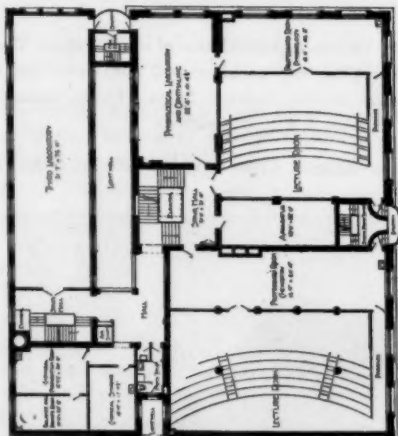
FOURTH FLOOR.



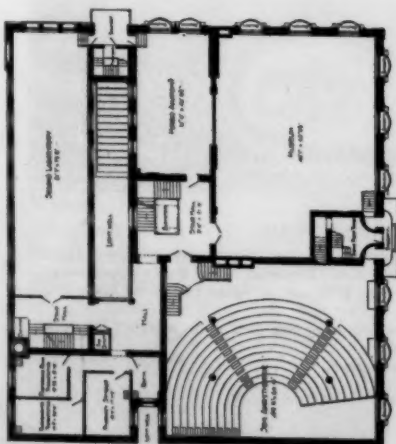
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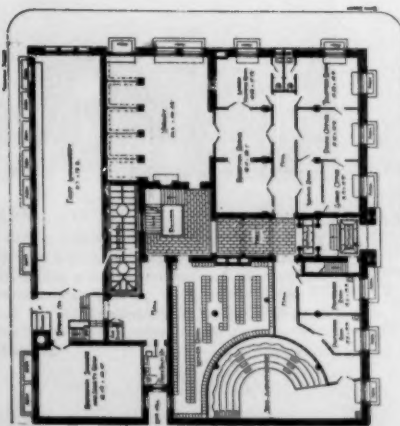
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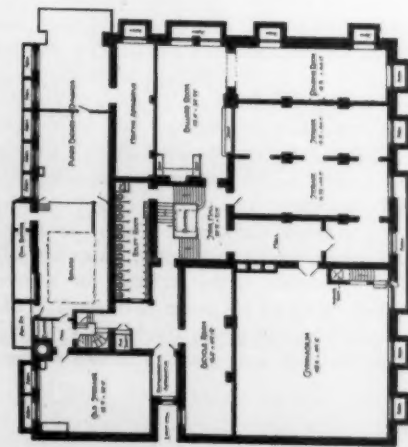
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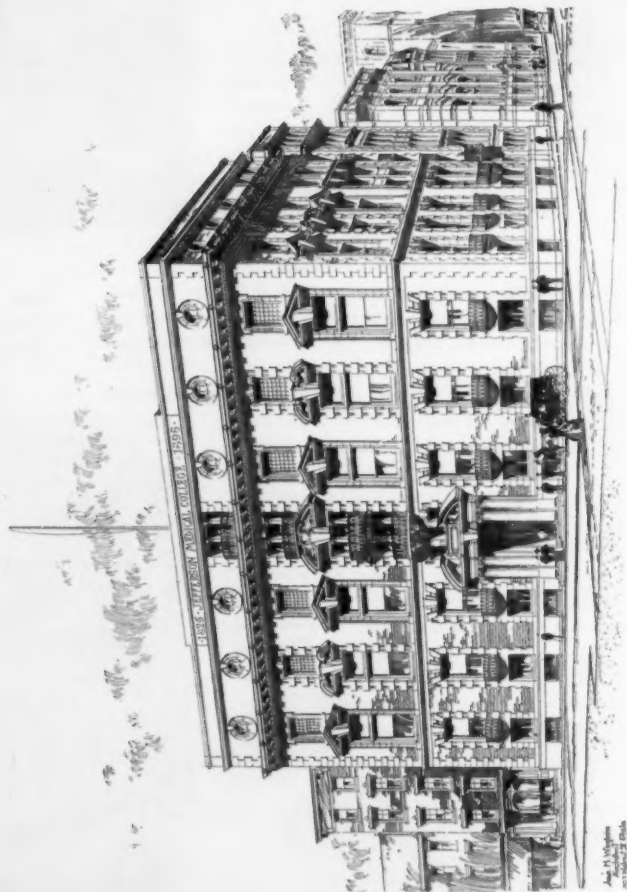
SECOND FLOOR.



FIRST FLOOR.



BASEMENT.



JEFFERSON MEDICAL COLLEGE, PHILADELPHIA, PA.
James H. Windrim, Architect.

Aug. 13, 1904
and 1905-1906



TERRA-COTTA DETAIL, ST. CHRISTOPHER'S CHURCH, NEW YORK CITY.
Executed by the Conkling, Armstrong Terra-Cotta Company.
Barney & Chapman, Architects.

The report of the Commissioner of Public Buildings for September shows a marked improvement in the class of work being done, as well as an increase in value over that for the same month last year of about 30 per cent.

The northeast corner of 6th and Olive Streets, around which memories cling of many visionary schemes in the past, ranging from six-story commercial buildings to twenty-two-story office buildings, is again attracting attention. This time it is proposed to erect a ten-story building at a cost of \$200,000, and a permit has been issued to the Reliance Building Company for such a building. Architect Theodore C. Link has prepared the plans.

Another corner which has been the subject of several speculative schemes, and for which a permit was once issued for a twenty-two-story building, is the southwest corner of Olive and 7th Streets. It seems as though this may also be improved at once, and, although it may not be so pretentious as some of its near neighbors, nor approach the clouds so nearly as some of the previous schemes contemplated, it may become more famous from an architectural point of view. The building faces two alleys as well as two streets, and consequently will have light on every side. It will be only three stories high and of stone. Mr. Isaac Taylor, the architect, will make the most of the opportunity, and place there an architectural monument worthy of so prominent a corner. The building is for the *St. Louis Daily Republic*. It is gratifying to find occasionally an owner who is willing to sacrifice something to the finer feelings.

James Bright has the contract for a six-story warehouse near Cupples station, for the Simmons Hardware Company. The building is 63 by 120 ft. on 9th Street between Clark and Walnut Avenues. The plans were prepared by Shepley, Rutan & Coolidge.

T. B. Annan is the architect for a seven-story building facing on 4th Street 52 ft., for T. J. Lackland.

Adjoining this property occurred a very disastrous fire a few days ago, resulting in two deaths and a

score or more of serious injuries. The building was occupied with sporting goods, and the fire and explosives completely wrecked it. It is rumored that it will be rebuilt at once.

The Commissioner of School Buildings, Mr. Wm. B. Ittner, recently awarded the contract for four more schools. The department is a year behind with its work and is striving to catch up.

CURRENT ITEMS OF INTEREST.

THE DAGUS CLAY MANUFACTURING COMPANY is furnishing 100,000 buff brick for a new power house at Williamsport, Pa.

THE GRUEBY FAIENCE COMPANY are lining a subway across Avon Street, Boston, for Jordan, Marsh & Co. It is to be done in a dull green and white.

THE BURLINGTON ARCHITECTURAL TERRA-COTTA COMPANY will furnish the terra-cotta for the new library at Hyde Park, Mass., and also for a new schoolhouse at Brookline, Mass.

THE SAYRE AND FISHER COMPANY, of Sayreville, N. J., have been very busy during the past season, and are placing orders for additional machinery with Chambers Brothers Company, of Philadelphia.

THE town of Somerville, Somerset County, N. J., has given the Berlin Iron Bridge Company, East Berlin, Conn., the contract for their new iron bridge. Span is about 60 ft., and the bridge has a clear roadway of 14 ft.

CHARLES BACON, Boston representative of the Excelsior Terra-Cotta Company, is supplying the architectural terra-cotta for the Whitman and Nonantum Blocks, Newton, Mass.; Fuller, Delano & Frost, architects; H. F. Ross & Co., contractors.

THE BERLIN IRON BRIDGE COMPANY, East Berlin, Conn., are



BURT'S THEATER, TOLEDO, OHIO.

The building is executed in three colors of brick and terra-cotta; the lower story is in a gray brick, with a gray terra-cotta string-course separating it from the superstructure. The darker part of the superstructure, as shown in the photograph, is in a golden-yellow vitrified brick, and the lighter part of the diaper in a light cream buff, with the terra-cotta matching it.

Brick furnished by the Columbus Brick and Terra-Cotta Company; terra-cotta by the Winkle Terra-Cotta Company.

George S. Mills, Architect.



RESIDENCE AT BUFFALO, N. Y.
George Cary, Architect.

furnishing for the Laffin & Rand Powder Company, Pompton, N. J., the steel roof for one of their storehouses. The building is 45 ft. wide and 150 ft. long.

THE KIT-TANNING BRICK AND FIRE-CLAY COMPANY is furnishing buff bricks, shade No. 2, for the new Mead Building at Buffalo; L. P. T. Eckel, architect; and their Akron, impervious, dark pink Roman brick for the new Robinson Building, same city and architect.

THE BERLIN IRON BRIDGE COMPANY, East Berlin, Conn., have the contract for furnishing the steel work for the Memorial Hall being erected at Westerly, R. I. This building is to be fire-proof throughout, has steel floor beams

and columns supporting the floor structure, and steel trusses and beams for the roof.

THE C. P. MERWIN BRICK COMPANY, Berlin, Conn., is furnishing the hollow brick for the Back Bay Station of N. Y., N. H. & H. Ry., at Boston; Shepley, Rutan & Coolidge, architects; Horton & Hemminway, builders. The company is making a specialty of side-cut headers in hollow brick, and is meeting with a large demand for same.

THE INDIANAPOLIS TERRA-COTTA COMPANY will supply the architectural terra-cotta which will be used in the new Law Building at Indianapolis; Louis H. Gibson, architect. The building is to be eleven stories high, and will have a frontage of 62 ft., which will be constructed entirely of terra-cotta.

THE C. P. MERWIN BRICK COMPANY, Berlin, Conn., is just completing its final shipments of ornamental red mud brick to the Pearl Street Church, Hartford, Conn.; C. A. Bartlett and Ernest Flagg, New York, associate architects. A great variety of shapes were required in this work, and the Merwin Company feel justly gratified at their success in filling the contract in such a creditable manner.

THE C. P. MERWIN BRICK COMPANY have added to their line of manufacture, hollow brick with closed ends. These are used for headers in connection with their other hollow brick. The following buildings are being furnished with hollow brick through their agent: the Connecticut Builders'



PARK THEATER, NIAGARA FALLS, N. Y.

(From *The Illustrated Buffalo Express*, Copyright, 1898, by Geo. E. Matthews & Co.)
The front brick are a dark flaked Roman, furnished by the Dagus Clay Manufacturing Company, Daguscahonda, Pa. Orchard & Joralemon, Architects.

Supply Company, Pepion Block, Hartford, Isaac A. Allen, Hartford, architect, Washburn Brothers, contractors; Arsenal School, Curtis & Johnson, Hartford, architects, Chas. B. Andrus, contractor.

THE CELADON TERRA-COTTA COMPANY, LTD., is supplying the following new buildings with their roofing tiles: J. B. Hanna residence, Columbus, Ohio, Yost & Packard, architects; Winnetka School, Winnetka, Ill., W. A. Otis, architect, Chicago; Superintendent's residence, Ohio State Hospital for Insane, Massillon, Ohio, Yost & Packard, architects, Columbus, Ohio; Boys' Industrial School, Lancaster, Ohio, Richards & McCarthy, architects, Columbus, Ohio; A. Houghton, Jr., residence, Corning, N. Y., Pierce & Bickford, architects, Elmira, N. Y.; C. L. Poston, residence, Athens, Ohio, Yost & Packard, architects, Columbus, Ohio; Audubon Avenue School, New York City, C. B. J. Snyder, school architect, New York; Geo. T. Dickover, residence, Wilkesbarre, Pa., J. H. W. Hawkins, architect; C. B. Scoville, apartment building, Oak Park, Ill., Patton, Fisher & Miller, architects, Chicago.

THE ILLINOIS SUPPLY AND CONSTRUCTION COMPANY is incorporated in both the States of Missouri and Illinois. The officers

are Wm. M. Louderman, president, and W. P. Grath, secretary and treasurer. The capital stock of same is \$75,000, being fully paid.

The business of this company is the manufacture of face brick in the following colors: solid white, buff, silver gray, pink, steel gray, mottled, red and brown; also dealers in builders' supplies, perfection mortar colors, terra-cotta, fire-proofing, and vitrified street paving brick. The company is operating the plant of the American

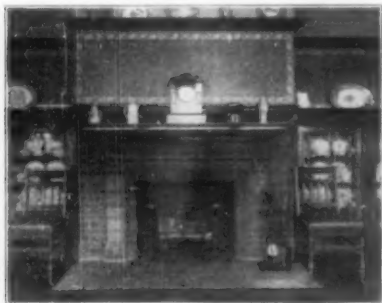
Hydraulic-Press Brick Company, located at Collinsville, Ill., eleven miles from St. Louis. The brick manufactured by them have a national reputation, being used in all the large cities of the States, and are manufactured by the latest improved hydraulic press, making brick of a uniform texture and free from granulation, every brick being subjected to a pressure of fifty tons. The plant is equipped with the latest improved Grath Patent Down-Draft Kilns, which patents are owned by the company. The company always keeps a large stock of plain and ornamental brick on hand in the various colors. In the later part of

May the works were visited by a disastrous fire, the entire brickmaking department being destroyed. In place of frame buildings a large two-story brick building has been erected.

Views of the plant are shown in the company's advertisement, page xii.



RESIDENCE OF FREDERICK W. WEITZ, DES MOINES, IA.
Frederick W. Weitz, Architect.

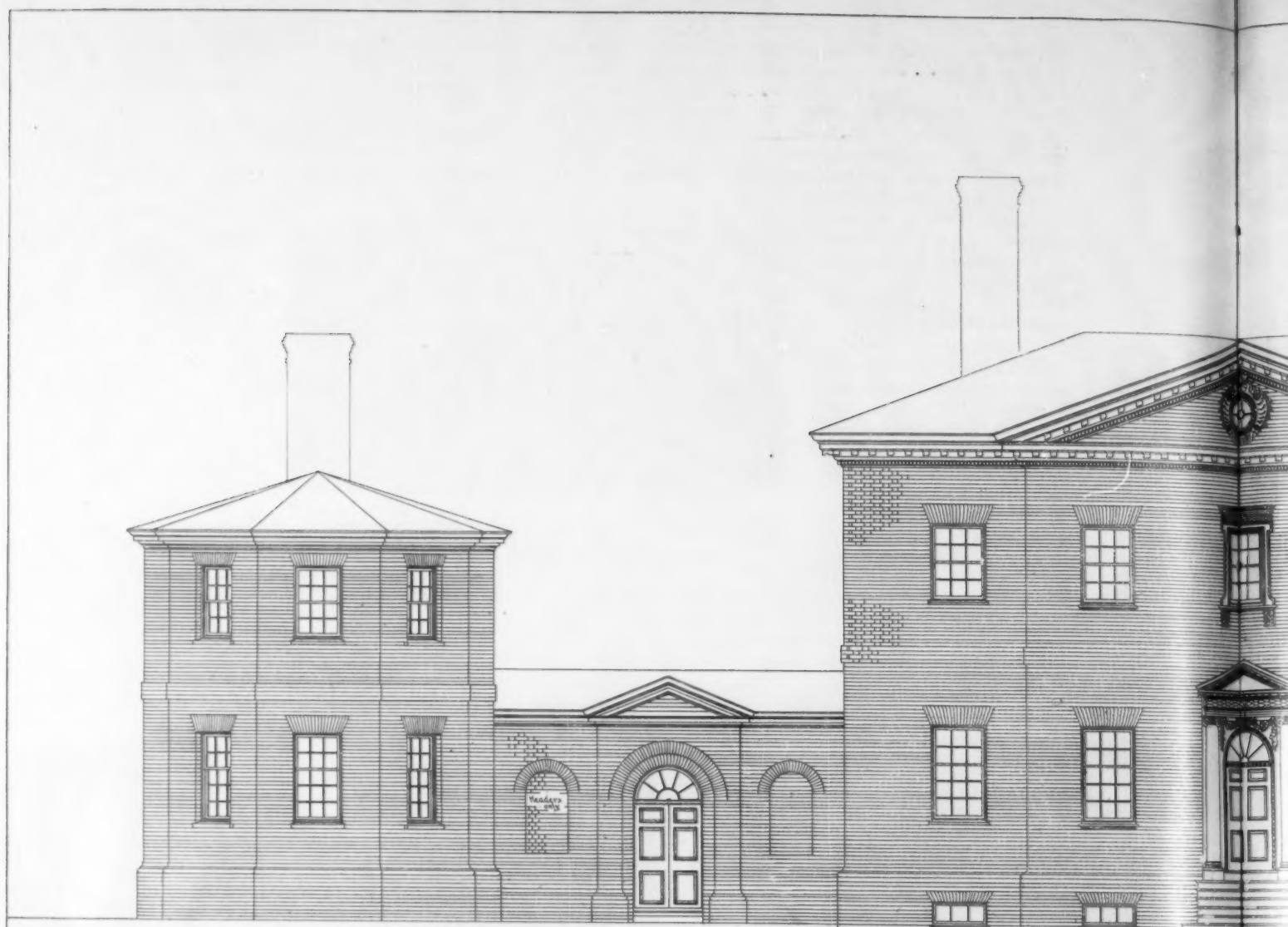


Fireplace Mantels.

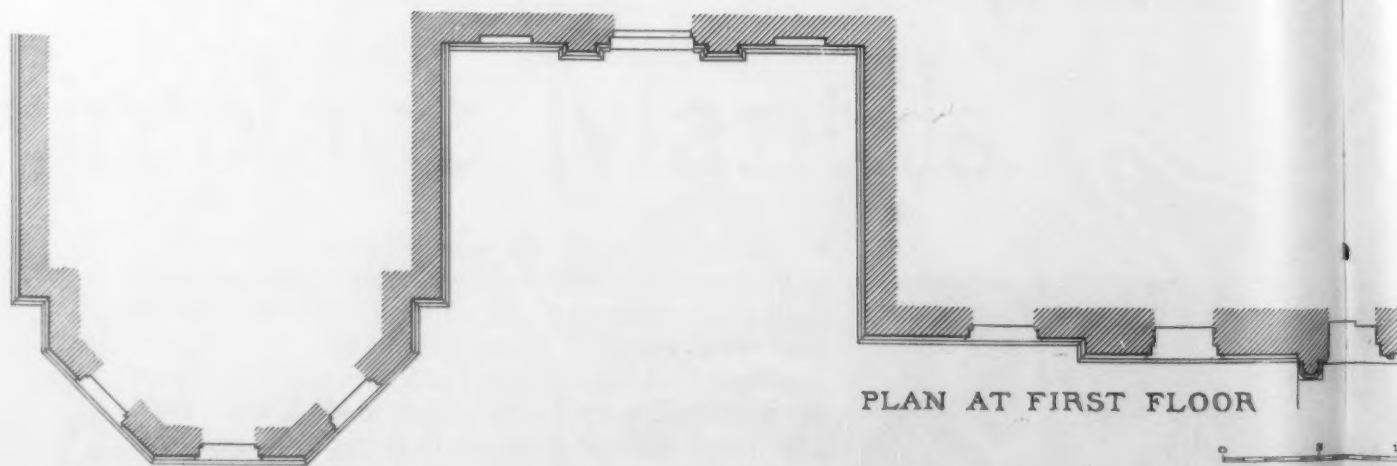
The best ones to buy are those we make of Ornamental Brick. There's nothing else as good or as durable. Our mantels don't cost any more than other kinds, and are far better in every way—our customers say so. Don't order a mantel before you have learned about ours. Send for our Sketch Book showing 53 designs of mantels costing from \$12 upwards.

Phila. & Boston Face Brick Co.,
15 LIBERTY SQ., BOSTON, MASS.





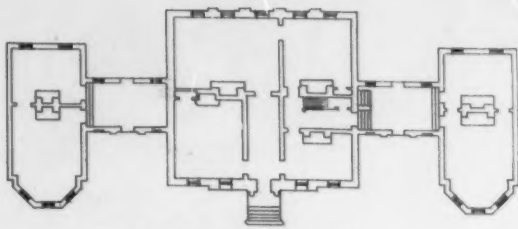
FRONT ELEVATION



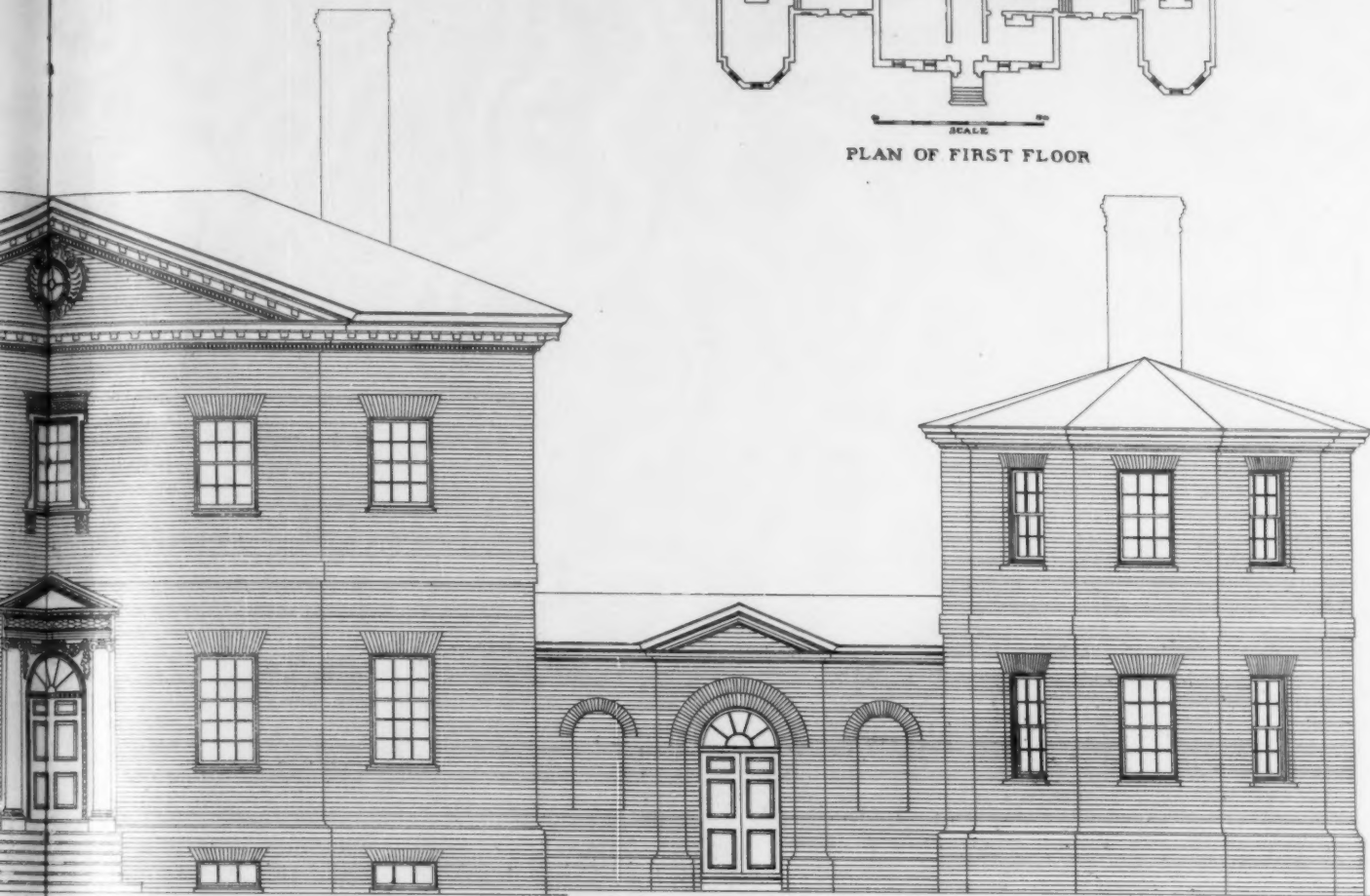
PLAN AT FIRST FLOOR

SCALE

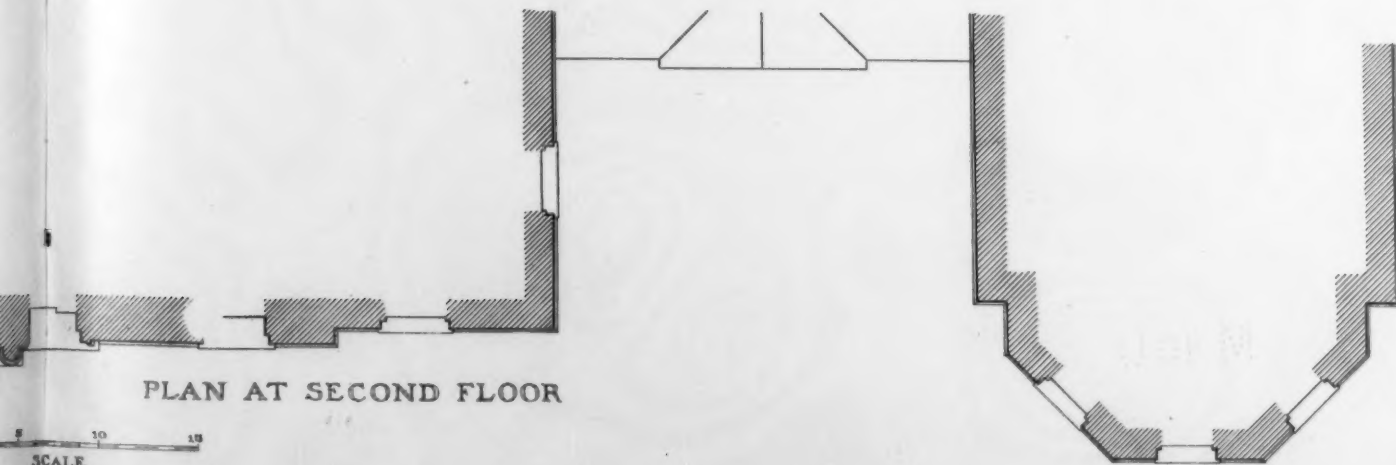
HARWOOD HOUSE, ANNAPOLIS, M.



PLAN OF FIRST FLOOR



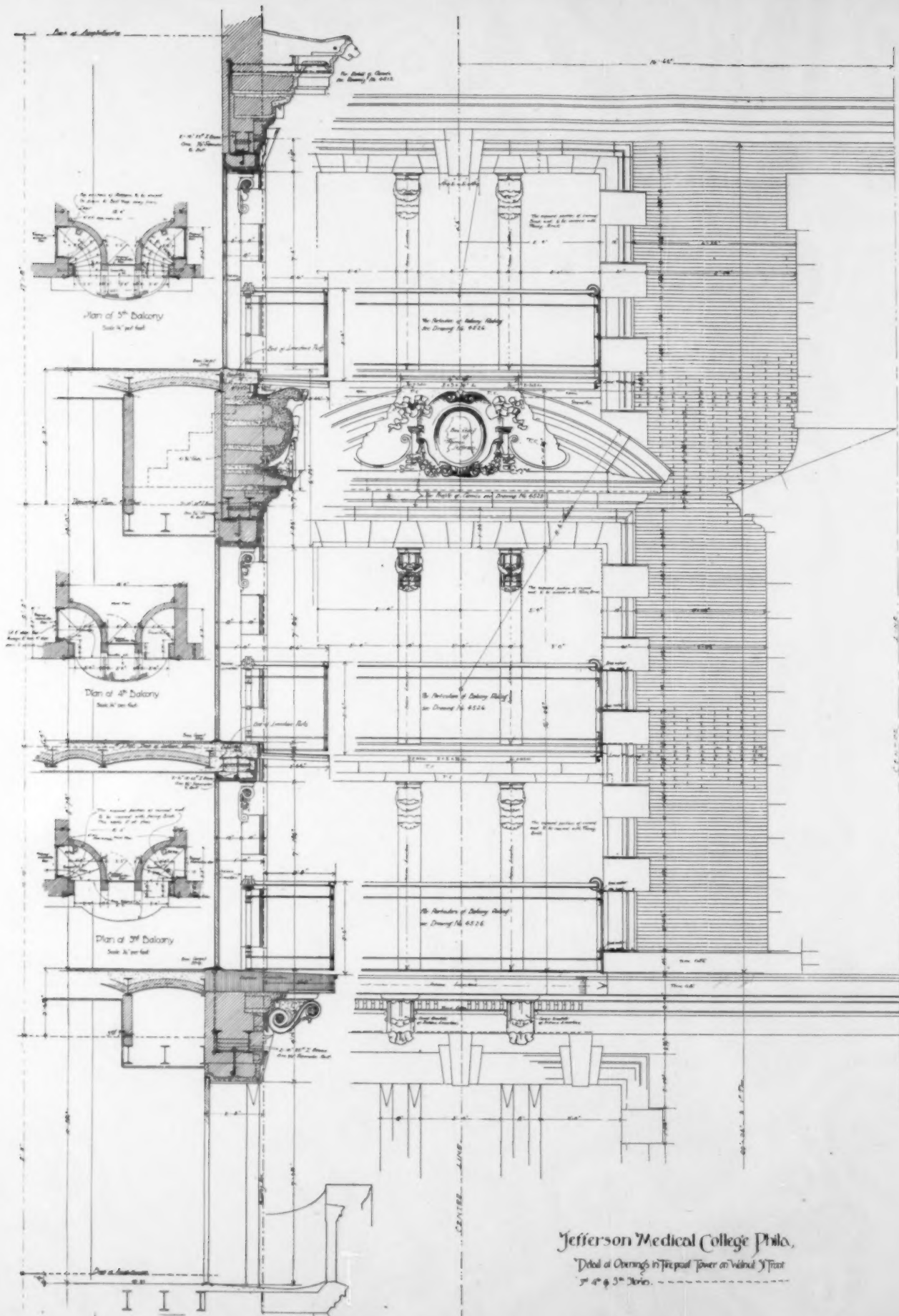
ELEVATION



PLAN AT SECOND FLOOR

MEASURED AND DRAWN BY CHARLES H. ALDEN JR. 1897

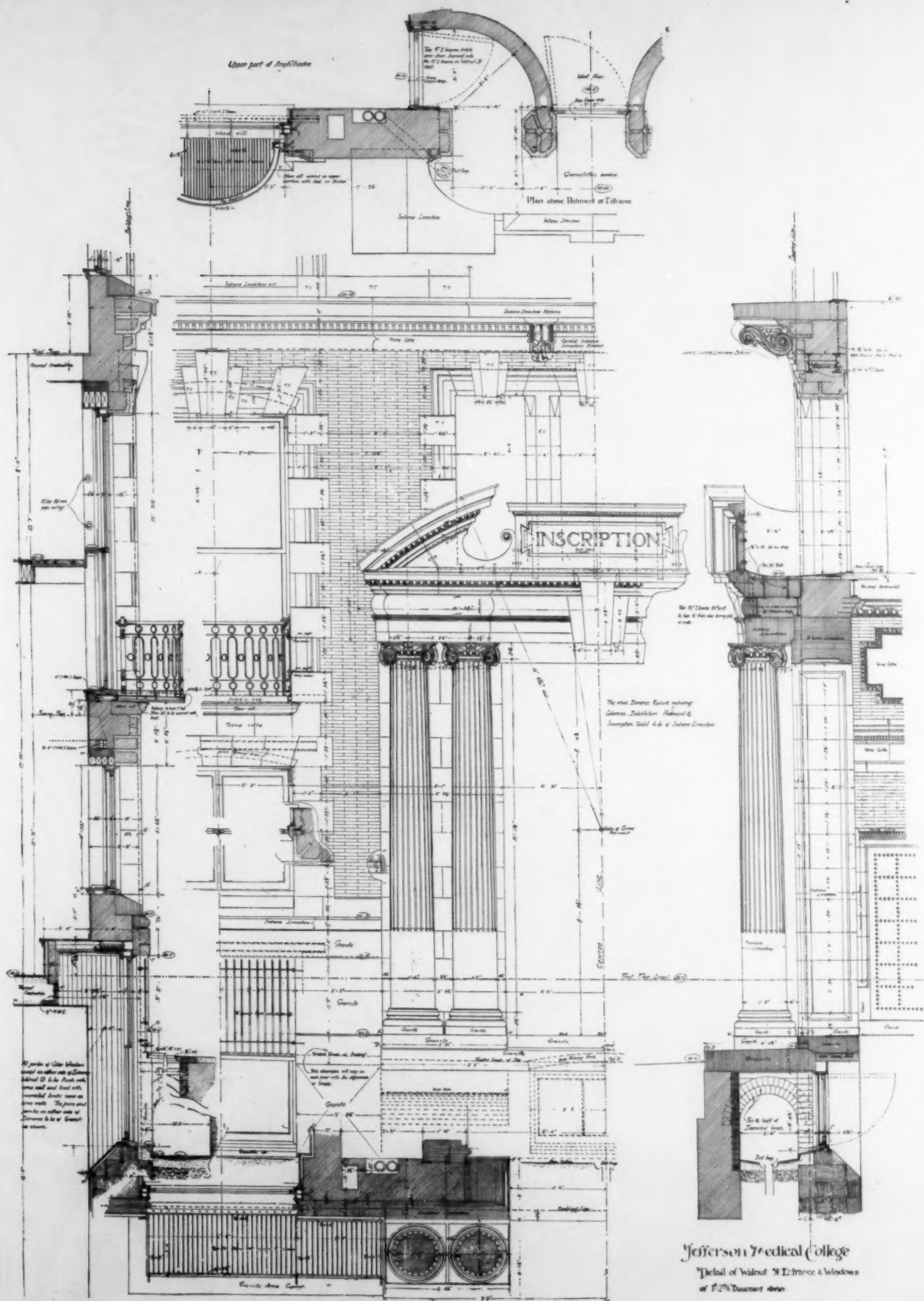
BALTIMORE, MARYLAND. BUILT 1770-1780.



Jefferson Medical College Phila.
Detail of Openings in Fire-proof Tower on Walnut Street
3d, 4th & 5th Stories.

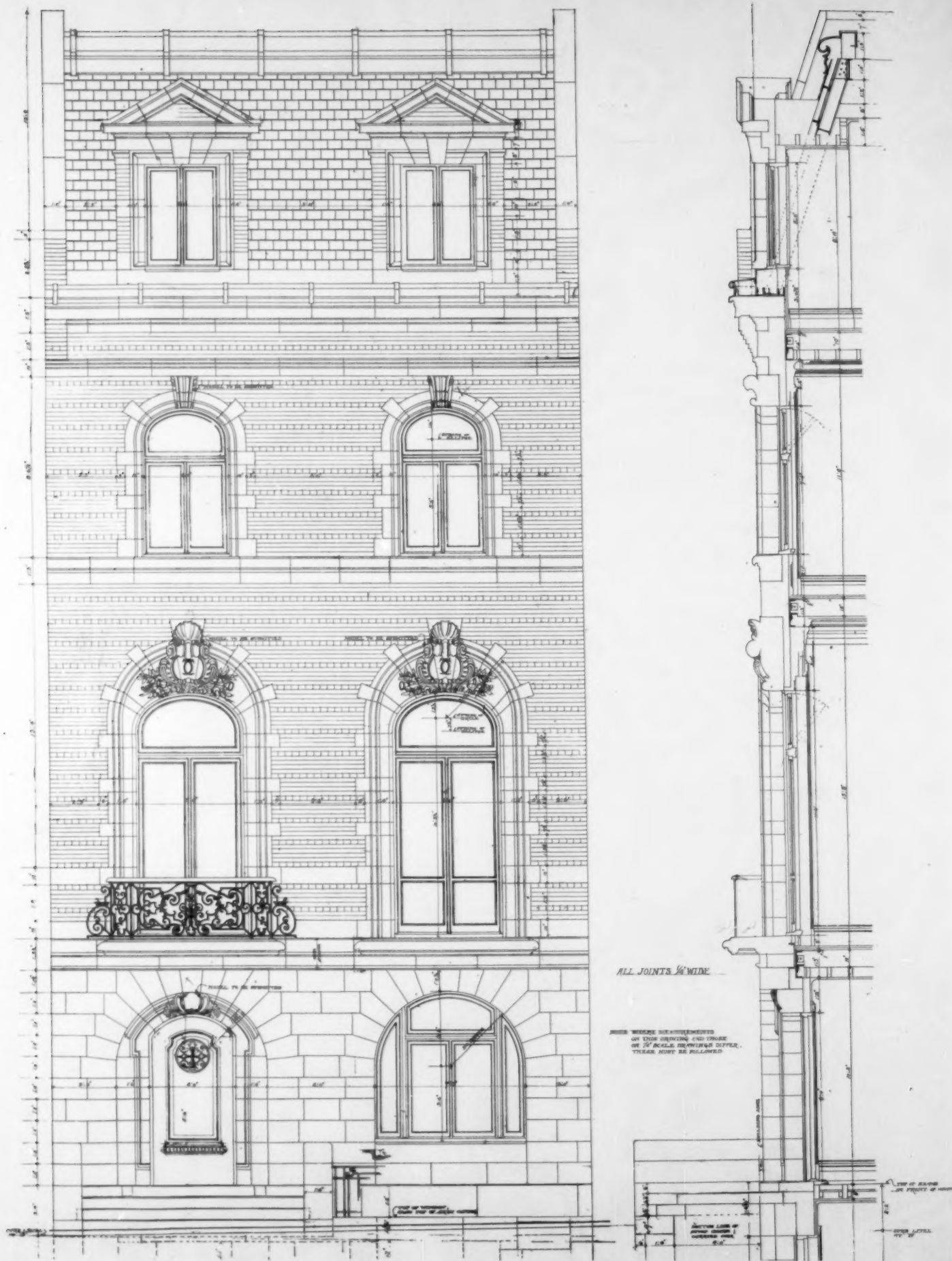
JEFFERSON MEDICAL COLLEGE, PHILADELPHIA, PA.
DETAIL OF OPENINGS IN FIRE-PROOF TOWER, 3D, 4TH, and 5TH STORIES.

JAMES H. WINDRIM, ARCHITECT.
(For plans and elevation, see page 219.)



JEFFERSON MEDICAL COLLEGE, PHILADELPHIA, PA.
DETAIL OF WALNUT STREET ENTRANCE AND WINDOWS OF 1ST, 2D, AND BASEMENT STORIES.

JAMES H. WINDRIM, ARCHITECT.
(For plans and elevation, see page 219.)



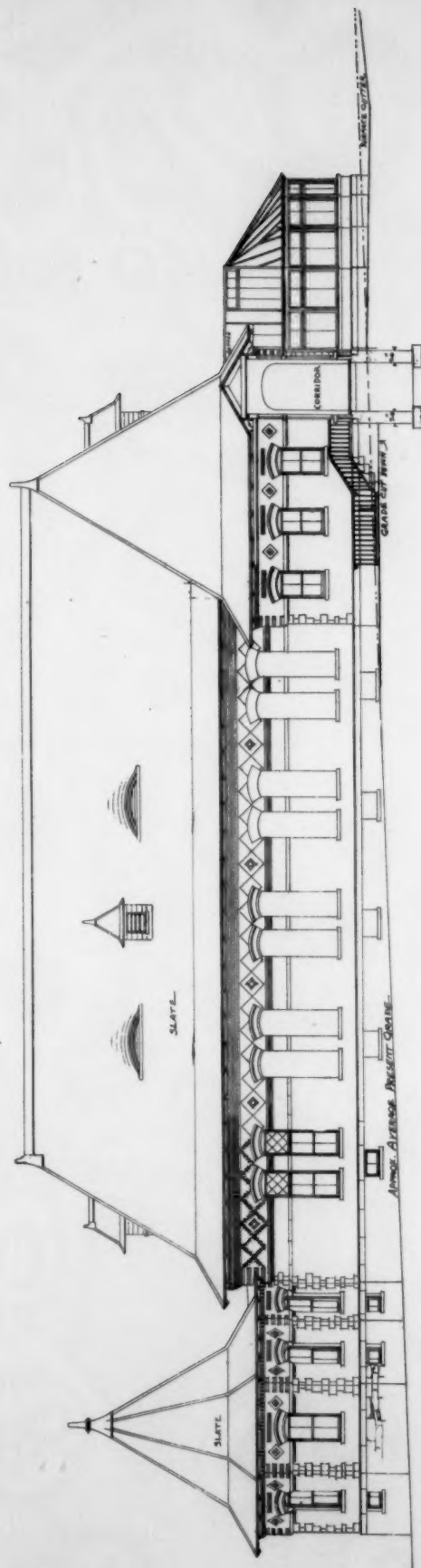
ALL JOINTS 1/4" WIDE

WHERE WORKING DIMENSIONS
OF THIS DRAWING AND THOSE
ON 1/4" SCALE DIFFER, THESE MUST BE FOLLOWED

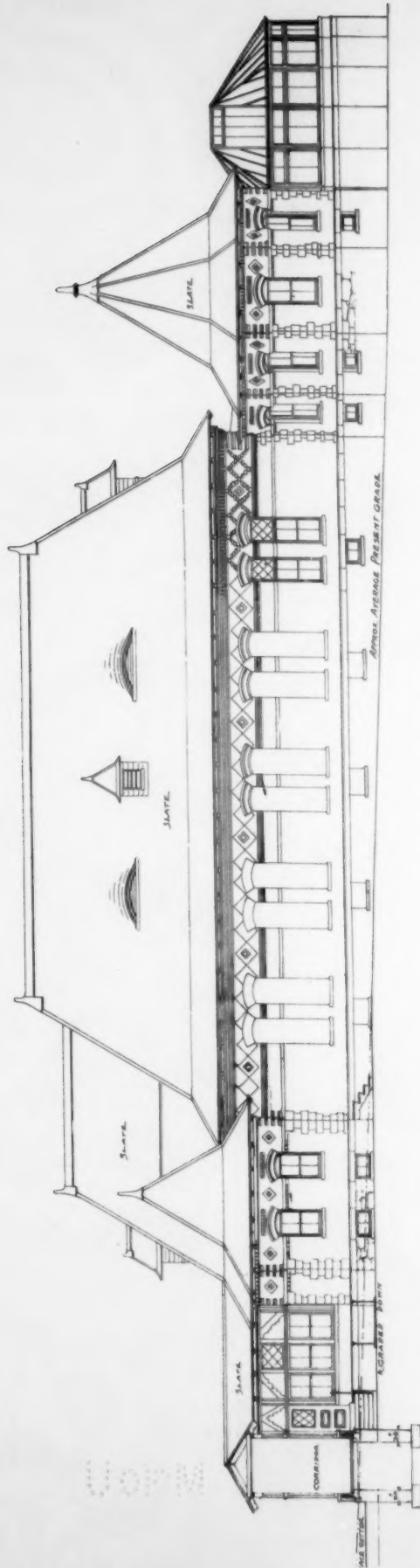
RESIDENCE, 85TH STREET, NEW YORK CITY.

DETAIL OF FACADE.

HOWARD & CAULDWELL, ARCHITECTS.



SIDE ELEVATION OF PAVILIONS. B. 1-2-3-4.

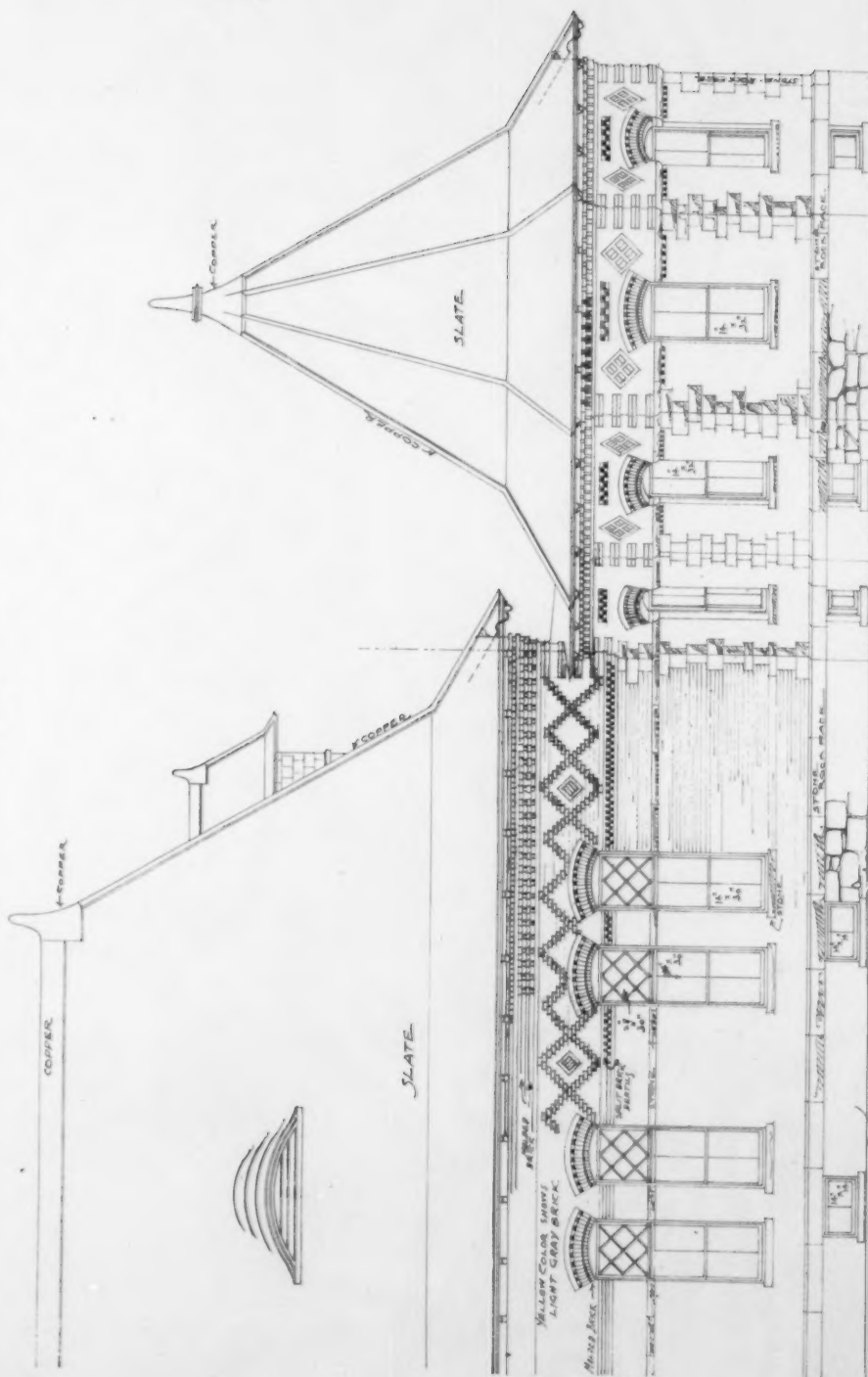


SIDE ELEVATION OF PAVILIONS. A. 1-2-3-4.

PAVILIONS FOR THE INFANTS' HOSPITAL, RANDALL'S ISLAND, NEW YORK CITY.
ISRAELS & HARDER, ARCHITECTS.



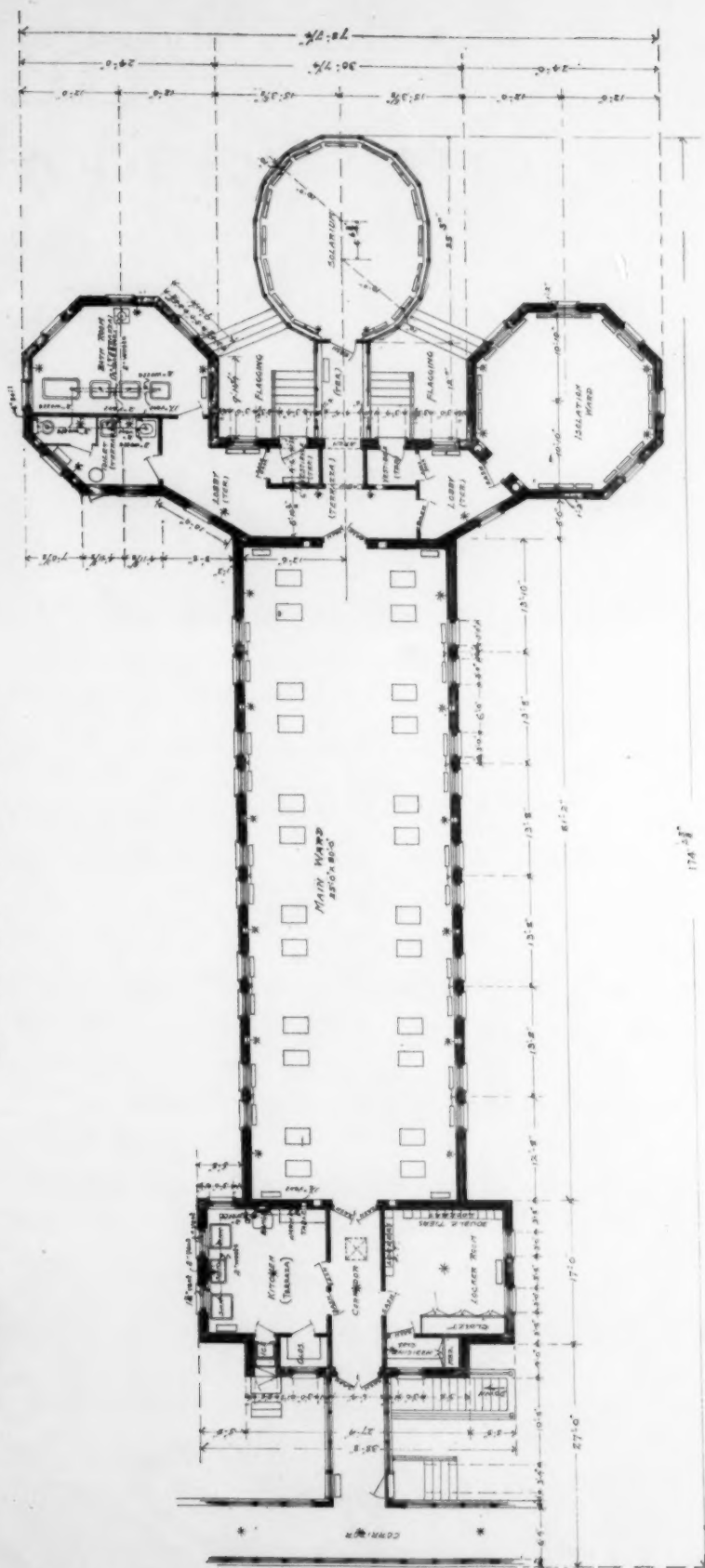
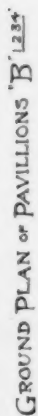
END ELEVATIONS OF PAVILIONS, B. 1-2-3-4.



DETAIL OF ELEVATIONS.

PAVILIONS FOR THE INFANTS' HOSPITAL, RANDALL'S ISLAND, NEW YORK CITY.

ISRAELS & HARDER, ARCHITECTS.



ISRAELS & HARDER, ARCHITECTS.

[illegible]



CHARLES T. HARRIS, President.
HENRY S. HARRIS, Vice-President.

WILL R. CLARKE, Secretary and Treasurer.
ALVORD B. CLARKE, Superintendent.

The Celadon Terra-Cotta Co., Ltd.,
MANUFACTURERS OF
ARTISTIC ROOFING TILE,
ALFRED, N. Y.
(Under Babcock Patents.)



TOWNSEND MEMORIAL HALL, OHIO STATE UNIVERSITY, COLUMBUS, O., COVERED WITH CONOSERA ROOFING TILES.
PETERS, BURNS & PRETZINGER, Dayton, O., Architects.

OHIO STATE UNIVERSITY.

ALEXIS COPE, *Secretary.*

COLUMBUS, O., April 18, 1898.

Mr. CHARLES T. HARRIS, Alfred, N. Y.

Dear Sir:—We have just completed two College Buildings, Townsend Hall, length 260 ft., average breadth 70 ft., three stories, and the Biological Building, length 110 ft., average breadth 75 ft., two stories, and for roofing have used Conosera Tile.

So far we have only praise to speak of it. It adds much to the dignity and artistic beauty of the buildings, and we are glad we were able to use it.

We recommend it without reservation. After seeing it on the Law and Dairy Buildings at Cornell, we were not satisfied with anything else.

Very truly yours,

ALEXIS COPE, *Secretary.*

**We have also covered the following named College Buildings,
beside those named above, with Conosera Tile:—**

ORRINGTON LUNT LIBRARY, Northwestern University, Evanston, Ill.
LIBRARY AT UNIVERSITY OF ILLINOIS, Urbana, Ill.
AGRICULTURAL BUILDING, Cornell University, Ithaca, N. Y.
SCIENCE HALL, at Syracuse University, Syracuse, N. Y.

NEW YORK OFFICE,
SUITE 1123-4, PRESBYTERIAN BUILDING, 156 FIFTH AVENUE.

CHICAGO OFFICE,
SUITE 1001-2, MARQUETTE BUILDING, 204 DEARBORN STREET.



THE DELMONICO BUILDING, 44TH STREET AND FIFTH AVE., NEW YORK CITY.
JAMES BROWN LORD, ARCHITECT.

TERRA-COTTA AND BRICK BY THE
NEW YORK ARCHITECTURAL TERRA-COTTA COMPANY,
PHILADELPHIA. 38 PARK ROW, NEW YORK CITY. BOSTON.